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CULTIVATION OF THE POTATO IN WESTERN AUSTRALIA.

(G. N. Lowe, late Senior Potato Inspector.)

The potato, besides being a most important article of diet in practically every civilised country of the world, produces the greatest weight of food per acre. Measured by the bushel, the return from an acre will far exceed that of any of the great cereal crops.

One very important feature of the potato crop is the place which it occupies in a proper system of crop rotation, particularly in lands which have been in cultivation for some years. It must be admitted, however, that this useful function is too often overlooked in this State, and the tendency is to plant land with potatoes year after year with a subsequent depletion of soils and diminution of the return.

SOILS AND LOCALITY.

For the production of maximum potato crops, genial weather conditions and a rich, loamy, well-drained soil, together with adequate moisture, are ideal. The potato, however, with proper treatment, will produce satisfactory yields in sand or clay, but due allowances must be made under such conditions. No soil, however rich, is too good for this crop, as it is a heavy feeder.

Generally speaking, the southern coastal areas of this State are the most suited to successful potato production, mainly owing to the assured rainfall and the fact that two distinct crops, the "general" or winter planted crop and the summer planting, are possible. Other localities are restricted to cropping in the season when sufficient moisture is available, namely, in the winter months.

Unless the grower finds it necessary to plant on new land at once, soils left in rough fallow from the previous season will give a considerably greater return, although very often the operations of "breaking up" and potato planting are combined with success. This method is often employed in heavily-timbered land, where partial clearing is adopted, the proceeds of the crop being devoted to the completion of the clearing. However, every opportunity should be availed of to increase the chances of bigger yields by fallowing, and aerating and sweetening

the soil prior to planting. It is hardly reasonable to expect soils which are improperly treated to make adequate returns.

Before the soil is finally decided upon, it is wise to avoid any locality where frost is likely to occur, as a promising crop may be ruined by this agency in the course of a few hours.

In the winter planting, for this reason, a westerly slope should be selected, if possible, as even when the plants are covered with frost, the warming atmosphere will generally disperse it before the direct rays of the sun can strike and bring about sudden thawing which causes the damage.

It may be well, just here, to explain briefly how the damage due to frost-bite on plants is brought about. Much, of course, depends on the stage of growth, as a tender sappy condition is much more susceptible to damage than a hardened woody growth. As the temperature falls to about freezing point, the plant saps are drawn out of the plant cells in the form of pure water, and eventually frozen. Should the thawing be sudden, however, as is the case when the rays of the sun strike directly on the plant, this essential water is not reabsorbed by the plant cells, and death takes place.

The effect is much the same as in a drought-stricken plant or one burnt by the sun, the lack of moisture in each case being the cause of death.

A small garden plot of potatoes or other plants susceptible to frost bite may often be saved from destruction when the frost is noticed on them by watering the plants with ice-cold water, which brings about a gradual thawing.

DRAINAGE.

Not nearly enough attention is paid to this important question, particularly in the areas of heavy rainfall in the Southern portions of the State. In order to obtain maximum results, drainage must be present naturally, or supplied artificially.

The presence of water in or on the soil exercises a great influence on the growth of the crop. An excess is just as detrimental as a deficiency, and the removal of the excess is known as drainage.

Most land has drainage naturally in some direction, though instances will be found of land which has only a limited degree of drainage, or in which it is lacking, and in land of this nature an improvement is both profitable and necessary to ensure proper cultivation and action of the plant foods.

Too much water in or on the soil has the effect of—

1. Delaying cultivation, particularly in winter and early spring.

2. Making and keeping soil cold because any warmth present goes to the raising of the temperature of the unnecessary water.

3. Excluding the oxygen from between the soil particles, and so delaying the breaking down of organic matter.

4. Preventing a proper depth of root development, for a shallow root development not only restricts the area from which the plant draws its plant foods, but should a dry spell intervene the shallow root system so induced restricts, to that extent, the depth from which the plant may draw moisture.

Proper land drainage then is most necessary in potato soils if anything like adequate returns are to be expected.

Narrow "lands" and deep water furrows kept open and free from obstructions are very effective in ridding overwet soils of their surplus moisture where a proper system of drainage cannot be instituted.

PREPARATION OF SOIL.

Having decided on the soil and locality, the next operation is the first ploughing, assuming that new or virgin land is to be turned to account. The paddock, of course, will be very rough after this treatment, which should be to a depth of 8 or even 9 inches if the horse power is available. It is advisable to leave the soil in this condition without even harrowing till the following season to allow of the maximum sweetening action of sunlight and air. It is hardly reasonable to expect a full return from land which has lain in an acid condition for centuries under heavy timber, and potatoes respond just as readily to fallow as any other crop.

Deep, thorough ploughing is essential for potatoes, not only from the standpoint of moisture conservation, but for the reason that the potato rootlets have no great penetrative power, and deep cultivation allows of a proper root expansion.

The planting of potatoes on grass land, commonly carried out in the South-West.

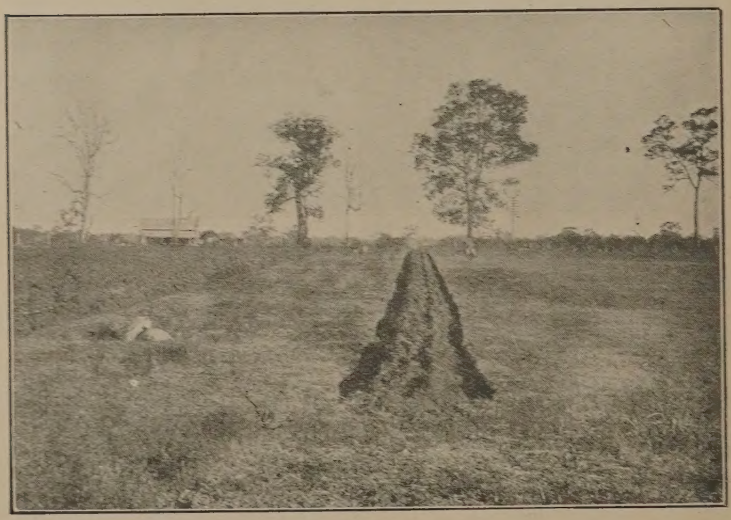
Nicely friable soil, deeply worked, drains more readily under wet conditions, and when thoroughly cultivated retains much more moisture should dry conditions intervene. For these reasons, then, deep ploughing should be adopted.

However careful the clearing of the land may have been, a certain percentage of roots and stumps will be found by the plough, and much annoyance and damage to implements will be averted if these are promptly removed. With the object of marking the position of such obstructions a supply of 15-inch long wires, bent over at the top and a piece of white cloth tied in the loop can easily be carried on the plough. As the roots are found the spot may be marked by one of these pegs and the grubbing of them carried out later rather than delay the plough at the time.

The "lands" (*i.e.*, divisions of the paddock by the plough from "finishing furrow" to "finishing furrow") should not exceed 11 yards in the winter crop, and in

a wet locality eight yards will allow of much better drainage and materially assist in the warming up of the soil which is to be sought after at that period.

A good "finish" which allows of surface drainage in the winter months.



Opening of the "crown" ready for planting.

"Lands" wider than half a chain cause waste of time in turning at "headlands."

Much depends, for the success of the crop, on the methods and thoroughness of cultivation and preparation of the soil, and every effort should be made to bring it to a satisfactory condition.

Because of the variation of soils no hard and fast rule can be laid down as to the means of bringing them to perfection in this direction, but thoroughness is the key to the position. This much is certain that indifferent methods of soil preparation cannot be corrected later by additional fertiliser, nor can the fertilisers have their maximum action if the condition of the soil is not what it should be. Instances often occur of fertilisers being blamed and declared below standard for this very reason.

SEED—ITS SELECTION AND TREATMENT.

Probably the most important phase of successful potato cultivation is the provision of the very best class of seed, and at the same time this is a feature which generally has too little attention paid to it.

No matter how ideal the conditions of soil, cultivation, fertilising and weather may be, without seed suited to the district and of a proper standard of vitality, it is futile to expect anything like a reasonable return from the crop.

It is astonishing how often anything in the shape of a potato is considered fit for planting, and the old maxim "like begets like" completely forgotten. Inexperienced growers, particularly, are often tempted by high prices to dispose of the very tubers that should be retained for seed, and keeping back for replanting small miserable stuff that could more profitably be turned into pork.

The same growers who are also stock owners would not, of course, apply the principle to the breeding of their animals, but carefully cull the poor ones and retain their best to breed up from.

It is not just pure luck that Melba XV., the world's champion cow, produced 32,522 lbs. of milk and 1,614 lbs. of butter fat during her lactation period, or that the world's champion hen laid 351 eggs in 365 days. Such results are only achieved by systematic and careful selection and breeding, and so with potato culture—the maximum can only be expected where the highest class seed is used.

A very important point to remember in the selection of seed is that the appearance of tubers is of no use when forming an idea of their value from an ultimate cropping standpoint. The degenerate (*virus*) troubles, such as Mosaic, Leaf Roll, etc., are only detectable in the foliage, and a "pretty" line of seed may quite reasonably be heavily infected, with no indication, either external or internal, to proclaim it. Good looking seed is very often only "good looking," and all sorts of care should be exercised in order to ascertain the "strain" and what happened in the way of yield and freedom from disease in the crop from which it came.

This is the very value of the certificate on bags of seed passed into the Certified Seed Scheme by the officers of the Potato Branch. The certificate does not make the seed in the bags one whit better, but it does afford the buyer a reasonable guarantee that seed which bears the certificate is the best obtainable each season, and comes from heavy yielding, disease-free crops.

Points to be remembered in the choice of seed potatoes are first that the variety should be true to name, free from disease both outward and inward; it should come from a heavy-yielding strain, and be suited to the district in which it is to be planted.

Internal disease is usually readily detected when the tubers are cut, and a buyer of seed should exercise this precaution before purchase. Skin diseases are, of course, more easily noticed, but no seed should be accepted showing signs of dis-

ease as numerous potato troubles are transmitted to the soil by this means, and such diseases made recurrent in that soil.

In an early district an "early" or quick-growing variety must be chosen to ensure proper maturity in the shorter season. Other things being equal, an early variety is preferable because of the fact that risks such as frost, flooding, and moth infection can often be avoided in the shorter growing period.

An excellent crop of potatoes (19 tons per acre) grown by Mr. Fred. Tonkin—Young's Siding.

Some districts, of course, are limited to winter planting, and growers in such localities are forced to buy supplies of seed each season. In cases of this kind the grower is well advised to make his purchases early and take prompt delivery in order to have the tubers in his own control until planting time arrives. First-class seed is limited in quantity, and so eagerly sought after by experienced men.

Where it is possible a special "stud" plot for seed production should be a first consideration, and instituted for the express purpose of providing tubers of the very highest productive strain from which to supply seed requirements. An area of about a tenth of the whole to be planted is generally adequate, and the potatoes grown in this portion should be from selected roots only.

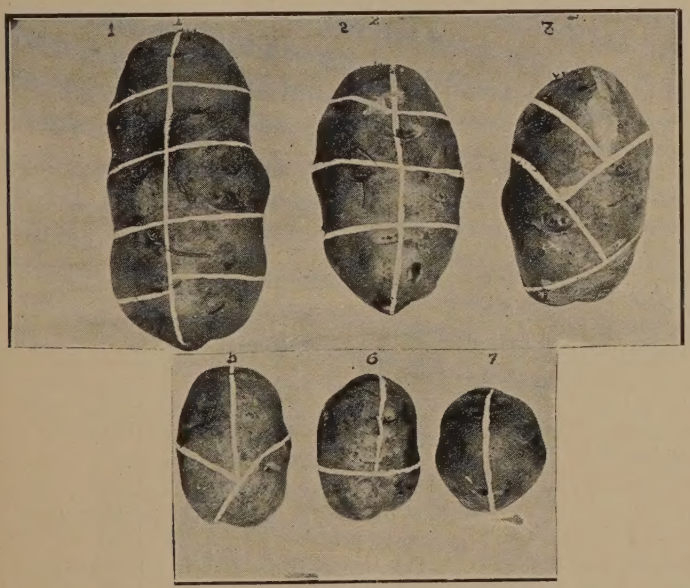
The plot should be isolated and planted quite separately from the commercial crop, and the greater the isolation the more certain will be the results. When the seed plot is well isolated from the main crop it can be subjected more easily to rogueing and general inspection. To obtain the best result from such an area during the period of growth it must be given the utmost attention in the matter of eradicating all weakly and abnormal plants. By adopting this method each season, a system of continual selection would be carried out, and the progeny from undesirable seed or diseased tubers would be eliminated, so bringing the seed to

a very high standard. Finally when the crop is dug the grower should aim at a very high standard of, say, not less than 7-9 large, shapely, normal tubers from each plant. This seed should be placed on racks for storage till required for planting the succeeding main crop. In another section of this pamphlet racking will be dealt with more fully.

The most desirable seed is that which has been root selected at digging, and not merely saved because it has come from a very heavy-yielding crop, because even in very heavy crops there is naturally a percentage of plants from which it is not wise to reproduce.

Mature and Immature Seed.—Many experiments have been conducted to test the relative values of what is called mature and immature seed. There is very little difference under average conditions as they obtain in our potato-growing areas. Well matured, disease-free tubers, kept under proper conditions, will make good seed and produce satisfactory yields.

Immature Seed—that is tubers that have not attained their full growth at digging time—will usually not keep well. Such tubers are subject to bruises, and the skin peels readily, thereby inviting the well-known storage disease of "Black



Methods of cutting seed potatoes.

Spot" or "Storage Trouble" of potatoes. Adverse storage conditions are more apt to injure such seed than seed that is ripe. Further, the question of maturity is only a relative one. It is said that a tuber is ripe when the skin adheres closely, and does not peel in handling. A tuber assumes this character when growth is checked by an attack of Early Blight (the cause of Storage Trouble) or as in the case of our summer plantings when early winter rains set in and arrest the natural maturing of the crop; in consequence a premature ripening is the result in both

instances. One advantage of using immature seed is its comparative freedom from disease, due to the fact that a crop so dug is not exposed so long to disease infection as is one allowed to ripen completely, but mature seed is only less productive when diseases are prevalent. This applies even more strongly in the case of degenerate troubles such as Mosaic, Leaf Roll, etc. Certified seed is more or less an answer, these tubers being selected from fully ripened and matured crops.

Such tubers must be cut at planting from the standpoint of economy, and the following illustration gives a proper idea of how this should be accomplished. One or two eyes are included in the cut portions ("sets") of a weight of two or three ounces, which should be "blocky" in shape rather than thin and narrow.

A simple and effective way of preventing the transmission of disease per medium of the knives when cutting seed is to provide two of these, keeping one steeped in a tin of disinfectant composed of five per cent. formalin and water. When it is noticed that a diseased tuber has been cut into, this should be rejected and the disinfected knife put into use. A very old thin table knife occasionally rubbed up on an oil stone is the best implement, and makes a clean cut not obtained when a thick clumsy knife is operated.

As an indication of the value of the large "set," the result of an experiment in Benger Swamp may be quoted. The trial consisted of varying weights of seed, viz., 1, 2, and 3 ounces in weight, and each experiment was replicated six times—not just one plot of each. Despite the driest season on record and the comparative failure of the swamp crop as a whole, in every plot the 3-ounce seed stood out in both germination, vigor and yield. The 2-ounce came next, and the poorest return was from 1-ounce sets.

Until recently, in this State, in the summer planting it has been almost general to use the small, whole tubers of about hen-egg size saved from the previous crop, due to its giving a better germination in average summer conditions than large seed cut.

This practice is undoubtedly responsible largely for the quick deterioration in yield in districts where followed.

Even when growing from large cut tubers in the winter (which has a tendency to keep up the strain), this care is undoubtedly to a great extent nullified by using small or "round" seed in the succeeding crop. As it is reasonable to suppose that the bulk of large potatoes come from heavy yielding plants, so is it reasonable to suppose that most small ones come from poor yielders or the very type which offers a poor chance of success comparatively.

Fortunately, only quite recently the adaptation of the results of an English experiment now makes it possible to plant large seed cut in the summer planting with germination equal to that of whole seed, so that the necessity for planting small whole seed and so restricting the yield has largely disappeared. To this method the name of the Wet Bag Treatment has been given.

WET BAG TREATMENT OF CUT SEED.

This is an adaptation of the result of an experiment conducted at Rothamsted Experiment Station and designed to discover the reason of the rotting of a large percentage of cut seed, whilst a proportion escapes.

After exhaustive tests it was found that where the cut surface of the seed was allowed to heal gradually or callous over in a warm, moist atmosphere, provided in the case of the experiments by cold frames, that a varnish-like substance called

"suberin" formed and provided a protective covering to the inner tissues, thus preventing the ingress of disease which would later cause the rotting of the "set."

The period allowed was from 24 to 48 hours for the treatment, and it was found that the cut seed then gave an equal germination to that of whole tubers and very much in advance of cut seed which was allowed to dry exposed to sun and wind.

It was recognised that this cold frame treatment would not be practicable under local conditions, and it was thought that the desired effect might be achieved for application by growers of this State for the treatment of large quantities of cut seed, if wet bags placed in boxes above and below the cut seed were used. No difficulty as to warm temperatures arises, of course, in this State when the summer crop is being planted in January and February, and the introduction of the wet bags was to provide the moisture necessary.

This treatment was found quite satisfactory as far as the healing over of the cut was concerned and trial plots planted with the treated seed demonstrated that the germination was excellent. Later it was found that merely bagging the seed as cut into wet bags and allowing 48 hours for drying was just as effective, and this preparation for cut seed for summer planting has now become fairly general and indications are that the same treatment applied to seed for winter planting gives a better germination.

The necessity for this in winter is, of course, not nearly as great as in the summer, but as it appears that another 10 per cent. better germination is possible under the wet bag method, this is certainly worth having by such simple means.

A point to remember is that sufficient time must be allowed for the proper callousing of the cut surface of the seed prior to planting, and this is, of course, governed by temperatures in either winter or summer.

"Wet bagging" in the South-Western districts, where very little "sprouting" of seed is followed, can be safely and profitably carrried out, but in the Great Southern areas (Albany-Denmark) where sprouted seed is invariably (and rightly) used, a wet bag folded and placed in the bottom of the planting tin or box with another such laid over the top of the receptacle will obviate loss of sprouts such as must occur in subsequent handlings were this class of seed simply cut into wet bags.

RACKING AND GREENING OF SEED.

Where it is found necessary to hold seed for any length of time, racks, or something similar, will be essential. A great quantity of otherwise good seed is rendered more or less valueless in this State each season by reason of the lack of this facility.

Failing racks, the seed is more often than not simply left standing in the bags sometimes under cover, more often not, until planting, by which time long, tender shoots have developed. Immediately the seed has to be handled these are either knocked off or purposely removed.

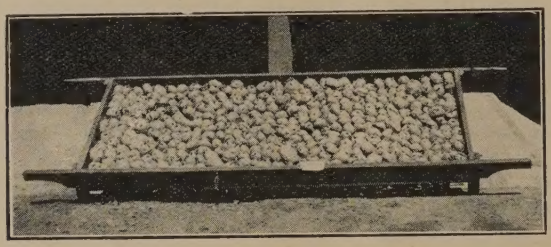
Each time this occurs the vitality and vigour of the tuber are naturally reduced as a certain amount of energy and plant food are drawn from the tubers in the formation of this new growth.

It is essential, therefore, that the original sprouts shall be retained, and racking of seed is quite the best way to accomplish this.

Exposure to the light considerably retards sprouting and hardens the seed by "greening" which is so desirable, where seed has to be held for any lengthy period.

Racking or traying is of decided benefit in that seed so stored is easily and quickly inspected and sorted; in addition the racks may be stacked to greater heights than can bags, with no resultant damage.

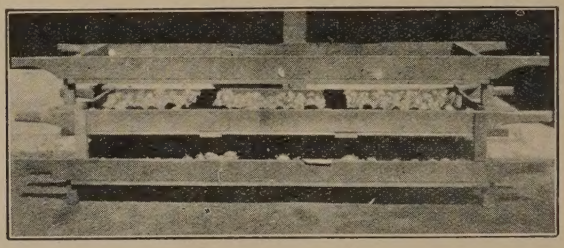
Racks as illustrated are readily and cheapily constructed and easily handled. These will hold a bag and a-half, when filled, not being too heavy for stacking to a height. The seed, when racked, should be placed somewhere in the light if "greening" and the checking of the sprouts be desired, but not, of course, actually in the direct rays of the sun. Under the shade of trees or in an open shed where there is a free air circulation is a suitable place for this purpose.



A simple type of seed rack.

Frequent inspections of the seed are necessary, and any tubers showing signs of rotting, "thready eye" or other troubles, should be removed and destroyed.

Where it is wished to induce sprouting a dark warm situation should be chosen where it is still possible to regularly inspect the seed on the racks.



Method of stacking racks.

Even where "greened" seed is used care in handling at all times is necessary, particularly when transferring to the paddock. This can be safely accomplished with sprouted seed where petrol or kerosene tins, with one side removed, are used. The seed is placed into the tins which are so disposed along the "land" to avoid unnecessary waste of time on the part of the planter as he operates. A handle of round timber into each end of which a stout nail is driven is provided, and this should be only sufficiently long to allow of easy transference from tin to tin as required. The nails fit holes driven into the ends of the tin near the upper edge, of course. Handles of stout wire are also used, and should the holes be punched slightly away from the centre of the tin, this will allow of additional room for the hand when filling with seed, and produces a tilting of the receptacle toward the operator when planting.

Seed that is only slightly sprouted may be quite successfully planted from the "koota" or planting bag, which is cut from a cornsack, or the double planting bag as illustrated.

Double planting bag.

WIDTH AND DEPTH OF PLANTING.

Naturally much depends on the season of the year at which planting takes place, and due allowances must be made in spacing the "sets," more particularly as to width between rows.

In early winter planting the width between rows can safely be 24 inches, although this spacing does not lend itself to convenient working of the crop by means of the horse cultivators. Later plantings should be made at 27 to 30 inches, according to the possibility of the soil drying out towards the time of maturity.

Summer planted crops are best planted at 30 inches, as moisture is often the limiting factor at this time.

The distance between "sets" should be about 18 inches throughout, except possibly when there is any danger of the soil drying out later, when intervals should be greater.

Generally the correct depth for "sets" is four to five inches, although in early-planted winter crops three inches is more suitable where "moulding" or "drilling up" is followed.

This operation is advisable in winter-planted crops, as it assists drainage and enables the soil to warm up more readily.

Summer-planted crops should be left "flat" to reduce loss of moisture.

Deep ploughing is advisable for at least two reasons, viz., that with the seed planted at the correct depth, should heavy rains be experienced, drainage is afforded, which keeps "sets" away from the accumulating water on the plough bed,

Planting from the double planting bag.

and later should dry conditions supervene, there are several inches of soil below the "sets" worked up to retain the necessary moisture to help carry on the crop to maturity.

Whilst ploughing to the greatest depth possible with the available horse power is distinctly advisable, the depth of planting should not be greater than indicated.

After planting it will be necessary to harrow thoroughly. In the winter planting this may be left with advantage for a week or ten days, provided the ploughing has been thorough and the seed properly covered, in order that the first weed seeds may be checked by the harrow.

Sets planted 4in. from the surface and 3in. up in the sod from the plough bed.

In summer planting rolling and harrowing under general conditions should not be left longer than a day, and a sound practice is to complete each day's work with these operations, so that all moisture possible may be conserved.

WEIGHTS OF SEED REQUIRED TO PLANT AN ACRE OF POTATOES AT DIFFERENT SPACINGS WITH SETS OF VARYING WEIGHT.

Distance between Rows and Sets.	1 oz. Sets.	1½ oz. Sets.	1¾ oz. Sets.	1¾ oz. Sets.	2 oz. Sets.
	T. C. Q. lb.	T. H. Q. lb.	T. C. Q. lb.	T. C. Q. lb.	T. C. Q. lb.
Rows 24in. apart—					
12in. spacing	0 12 0 17	0 15 0 21	0 18 0 26	1 1 1 2	1 4 1 16
14in.	0 10 1 7	0 12 3 16	0 15 1 25	0 18 0 7	1 0 2 14
16in.	0 9 0 23	0 11 2 0	0 13 3 7	0 16 0 13	0 18 1 18
18in.	0 8 0 12	0 10 0 15	0 12 0 18	0 14 0 21	0 16 0 24
Rows 26in. apart—					
12in. spacing	0 11 0 5	0 13 3 6	0 16 2 8	0 19 1 9	1 2 0 10
14in.	0 9 1 14	0 11 4 24	0 14 0 7	0 16 7 17	0 18 3 0
16in.	0 8 1 14	0 10 1 24	0 12 2 7	0 14 2 17	0 16 3 0
18in.	0 7 1 13	0 9 0 23	0 11 0 5	0 12 3 15	0 14 2 26
Rows 28in. apart—					
12in. spacing	0 10 1 7	0 12 3 16	0 15 1 25	0 18 0 7	1 0 2 14
14in.	0 8 3 2	0 10 3 23	0 13 0 17	0 15 1 7	0 17 2 4
16in.	0 7 3 7	0 9 3 2	0 11 2 25	0 13 2 20	0 15 2 14
18in.	0 6 3 14	0 8 2 10	0 10 1 7	0 12 0 3	0 13 3 0
Rows 30in. apart—					
12in. spacing ...	0 9 2 8	0 11 3 24	0 14 1 12	0 16 3 0	0 19 0 16
14in.	0 8 0 14	0 10 0 17	0 12 0 21	0 14 0 24	0 16 1 0
16in.	0 7 1 0	0 8 4 7	0 10 3 14	0 12 2 21	0 14 2 0
18in.	0 6 1 14	0 7 3 26	0 9 2 9	0 11 0 20	0 12 3 0

INTERTILLAGE.

A proper working of the crop between the rows is necessary as soon as these are defined, and should be attended to as occasion demands right up to the time when the rootlets of the plants in spreading prohibit this.

In old weedy land it will be necessary to hand hoe along the rows where the horse implements are ineffective.

The improved planting and manure sowing machine being used in Benger Swamp.

FERTILISERS.

Of the various elements in the soil, necessary for the promotion of plant life, there are usually only three which are not present naturally in sufficient supply for the production of heavy yields.

These are nitrogen, usually supplied artificially by sulphate of ammonia, phosphoric acid supplied in superphosphate and potash, derived artificially as a general thing in this State by the addition of sulphate of potash.

The addition of farmyard manure, whilst highly desirable, is rarely made owing to its scarcity, but this, in conjunction with properly compounded artificials, will give much better results than either separately. Because of the lack of farmyard manure, resort should be made to green manures such as peas and clovers, both of which incidentally will reduce the necessity for the inclusion of so much nitrogen in the artificials, as the legumes have the characteristic of fixing in the soil this element from the atmosphere. Nitrogen is the most expensive portion of potato fertiliser per unit, and green manuring of this description will considerably reduce this side of the fertiliser bill.

A very great factor in the use of heavy green manuring is the benefit to the soil derived mechanically. Organic manures also exert a far-reaching effect on the bacterial and physical properties of soils.

Artificial fertilisers cannot replace organic manures completely, as the latter have a much wider function and probably these uses are not paid sufficient attention by the average potato grower in this State.

In the South-West portion of this State, at least, more growers are finding out by actual experience the benefit which accrues by ploughing under green subterranean clover at intervals of three or four years as the pastures need renewing.

Both crops benefit immensely, the potato at once and the clover in the ensuing seasons.

Nitrogen promotes the vegetative growth of plants, and the effect is noticeable in luxuriance of leaf and green colouring. An excess will produce superabundance of "top" in potatoes, with a darker green than usual, and maturity is considerably delayed, whilst a deficiency results in a general stunting of the plant, accompanied by a yellowness of the leaves.

Sulphate of ammonia is the most common source of nitrogen, both as a furrow application and as a top dressing. Nitrate of soda, another source, has not been found at all successful in the furrow, but can be used as a top dressing where an immediate effect is desirable. Early winter crops respond most profitably to a top dressing of two cwts. per acre of sulphate of ammonia just as the crop is showing in rows. Care must be exercised, however, in not allowing the chemical to come into direct contact with the plant, as otherwise burning will result.

Experience goes to show, more particularly of course where backward seed is used in the winter planting, that the bulk of the nitrogen applied in the furrow as sulphate of ammonia has leached out before the plants can put it to profitable use, and because of this a sound procedure for this particular planting is to apply nearly all the sulphate of ammonia as a top dressing, and so derive the maximum benefit from it by this means. The condition of the seed, however, must govern this.

Phosphates.—These are in poor supply in our soils, and the deficiency must be made up by applying some form of phosphatic manure. Bonedust or bone flour was at one time largely used, but this has now been superseded by superphosphate which is generally accepted as being more suitable, supplying to the crop phosphoric acid, the greater proportion of which is water soluble, and therefore more readily available to the plant. Moreover, the plant food so provided is considerably cheaper based on unit values than when bought in other forms.

Basic slag is not suitable for inclusion in a potato fertiliser, as the phosphates so contained are not in a form readily available for potatoes.

The functions ascribed to phosphates are:—The stimulation of the root system and the hastening of ripening of the plant to maturity.

Up to the present, from experimental work, it appears that in all soils tried out to potatoes in this State, the application of superphosphate in far heavier dressings than in other parts of the world, or even in other States of Australia, is desirable and profitable.

Potash.—The importance of this plant food for potatoes can be readily understood when it is recognised that one of its chief functions is the elaboration of starch. The starch content of a potato largely constitutes its food value, hence the necessity of the inclusion of potash in the potato fertiliser, where cooking qualities are concerned.

Whilst potash reduces to an extent the green colouring matter or chlorophyll in the leaves, it nevertheless materially assists in the function of assimilation, and is very valuable for this reason alone. In some potato-growing districts in this State, particularly the South-Western division, the growers have neglected to supply potash in their fertiliser application for a number of years, but now find it increasingly necessary as a consequence. In the Great Southern district, more particularly in the peat swamps, the provision of potash is a prime necessity, though the nitrogen dressing for such soils can quite easily be overdone, because of the high content of this plant food naturally available in such soils.

Potash also has the effect of delaying maturity, in opposition to that displayed by phosphates of hastening maturity. In some soils in Western Australia the use of potash has a most marked effect in the increase in yield; in others this is not nearly so sharply defined, but in all cases where potash is applied, an increase of starch is shown on analysis.

Lack of potash is quite plainly shown in a potato crop by a distinct coppery tinge in the foliage, and an unusually early death of the plants.

Potash for potatoes may be regarded as an absolute essential, not only in peat soils, but in sand and soils which are gravelly in composition. Even in heavy loams and clays, which may generally be regarded as containing a fair quantity of natural potash—this ingredient of the plants' requirement is necessary, and should be provided by the grower, for the reason that the potash naturally present may not be sufficiently available.

Sulphate of potash is generally regarded as producing a drier and better quality tuber than muriate or other lower grade potash salts, though nothing definite locally has been proved in this direction.

The constitution and applications of fertiliser.—First and foremost it must be remembered that lack of drainage and faulty or insufficient preparation and cultivation of potato soils cannot be rectified by the composition or heavier application in the manurial system.

Fertilising is dependent very largely on climatic and soil conditions, and each grower must adjust his mixture and application to cover these.

For this reason it is not possible to lay down a hard and fast system of fertilising for all classes of soil in different districts.

A very successful mixture in good loams, and applied at the rate of 16 cwt. per acre, is:—Superphosphate, 15 parts; sulphate of ammonia, 5 parts; sulphate of potash, 5 parts.

Peat soils, being high in natural nitrogen, require less of this, so that the sulphate of ammonia should be reduced and an addition of sulphate of potash made.

The following mixture will be more suitable for peat soils:—Superphosphate, 15 parts; sulphate of ammonia, 3 parts; sulphate of potash, 8 parts: applied in the furrow at the rate of 16 cwt. per acre. Hand sowing of fertilisers still remains a general practice in Western Australia, although the modern planting machine does the job well where intelligently used.

In the application of chemical fertilisers proper care must be exercised to avoid direct contact with the seed, particularly the cut surface. Recent experiments show most conclusively that an appreciable loss, up to 15 per cent. in germination alone, occurs when this important detail is not observed. A lack of vigour during growth is also plainly noticeable, and consequently a decreased yield follows.

The seed should be gently pressed into the "mould" of the soil just turned, so that no direct contact may occur. This, of course, entails a little extra time compared with the haphazard practice, so often noticed, of dropping the set anywhere, but is distinctly worth while.

The fertiliser should be applied evenly and uniformly so that every plant receives an equal quantity. A wide-mouthed 3-gallon bucket is desirable for purposes of fertiliser distribution, and is much more convenient than the ubiquitous kerosene tin converted for this purpose.

HARVESTING.

The ripening of the tubers is denoted by a general and normal yellowing of the foliage and subsequent drying off of the tops, but harvesting is often regulated by market prices. While root-selected seed may be lifted before this stage has been reached, if the tubers are intended for storage for a period they must be properly mature—this being ascertained by the skin being set.

Hand-digging is still the most popular form of lifting the crop in this State, but the machine digger gives satisfaction when conditions are suitable, and greatly reduces this heavy item in the cost of cropping.

GRADING.

It will be found far more satisfactory to pick up the tubers at digging without attempting to grade in the field, and later make a separate operation of this. Should the crop not be thoroughly ripe, however, grading in the paddock must be resorted to, and too much handling avoided.

A "screen" or grader reduces the time, and makes for efficiency. This is in the form of a sloping table with side-boards and slatted floor constructed to any convenient size, the bags being suspended in front and sides as needed.

It is not generally realised how important correct grading is and what an influence this has on returns, or closer attention would be given to it by growers.

STORAGE.

Storage, to be successful, depends upon temperature, aeration, soundness of the tubers and moisture, particularly freedom from Potato Moth infection. Layers of tubers of not more than three feet in depth covered by straw, and where conditions are otherwise suitable, stacking reasonably high in bags in an airy, well-ventilated shed, are sufficient in the cooler areas of the State. Cool storage at about 40 degrees F. is perfectly satisfactory, but too costly under the present conditions. Any device which tends to reduce temperature during our hotter months adds to the success of storage. The practice of "pitting" or "clamping" cannot safely be practised in Western Australia, and the necessity for it does not arise during the winter.

ERRATUM.

In the December issue of the *Journal of Agriculture* there occurs a typographical error in the Horticultural Notes, wherein the writer (the Superintendent of Horticulture) is reported to have anticipated, prior to the advent of thrip, that the apple crop for the year would be 2,250,000 bushels. This should read 1,250,000 bushels, and the error makes it appear that the damage done by the thrip is much greater than is actually the case.—Ed.

"THE JOURNAL OF AGRICULTURE"

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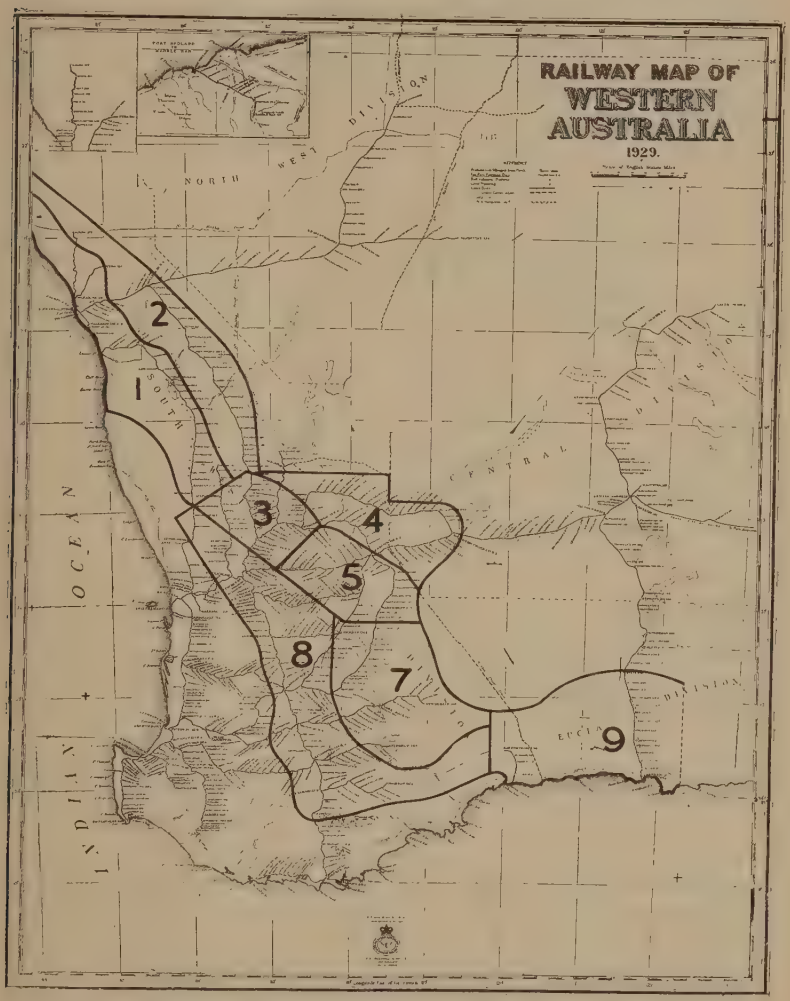
THE "ROYAL" AND DISTRICT AGRICULTURAL SOCIETIES' 50-ACRE CROP COMPETITIONS, 1930.

I. Thomas,
Superintendent of Wheat Farms.

Ten years ago the first Royal Crop Competition in this State was conducted. Starting in a small way, with fifteen entries, the crop competitions have grown in importance and improved in technique, until to-day they occupy no mean part in the life of the agricultural community. In the earlier competitions the entries were received direct by the Royal Agricultural Society, but in 1923 affiliated District Agricultural Societies were encouraged to conduct district crop competitions, and the first and second prize winners of each district competition competed for the Zone Championships. This effected a very considerable improvement in the number of entries. Farmers living in localities where no district competition was being conducted were not debarred from competing, as they were permitted to make their entry direct with the Royal Agricultural Society.

As can be readily understood, there is a considerable variation in rainfall, soil, etc., in a wheat belt so widely scattered, extending, as it does, from Ajana in the North to Scaddan in the South-East. A subdivision has therefore been made, and the wheat belt divided into eight zones, in such a manner that districts having similar interests and climatic conditions have been grouped together. This division was made in 1925 and has remained unchanged, excepting for a few alterations, the most important of which were the creation of a new zone, No. 9, in 1929, to embrace the Ravensthorpe and Esperance areas, and the elimination of No. 6, which was absorbed into No. 8. This division of the wheat belt has the

added advantage of making it possible for the one judge to inspect all the competing crops in the one zone. The accompanying map shows the eight zones referred to.



In each of these zones a championship prize of £10 and a second prize of £2 10s. are awarded. The competitors eligible for these awards are the first and second prize winners of the competitions held by the affiliated district Agricultural Societies, and those competitors who have entered direct with the Royal Agricultural Society, because of no district competition being conducted in their own district.

In addition to these zone prizes the Royal Agricultural Society each year offers a special prize of £5 5s. to the competitor in any zone obtaining the highest calculated bushel yield per acre. This prize was first offered in 1925.

The conditions of the competitions require that the crop shall be grown on fallowed land, shall not be less than 50 acres in area, of one variety, and shall be judged under the following scale of points:—

Yield	50	points
Freedom from weeds	10	„
Freedom from disease	10	„
Freedom from admixture	15	„
Evenness of growth	15	„
Total	100	„

The system adopted has been to allot one point for each calculated bushel yield, which is determined not by estimation, but upon that calculated from portions of the crop obtained from small areas taken systematically throughout the crop. These samples are then threshed and the grain weighed.

As an indication of the improvement in yields, brought about by these competitions, it is interesting to note the alteration to the scale of points for yield, rendered necessary by the increased yields of the leading competitors, as is illustrated in the following table:—

Year.	Scale of Points for Yield.	Highest bushel yield in Competition.
		bus.
1921	30	...
1922	30	...
1923	35	40
1924	35	36
1925	40	36
1926	40	38
1927	40	40
1928	40	40
1929	50	46
1930	50	43

Since the inception of the Royal and District Crop Competitions, the judges have been departmental officers attached to the Wheat Branch of the Department of Agriculture.

The awards and judges' reports, together with a detailed analysis of the cultural details of all competitors, have been prepared and will be found in the following pages:—

ZONE 1.

Judge—I. THOMAS, Superintendent of Wheat Farms.

Royal Society—6 Competitors.

Three Springs Society—3 Competitors.

Total—9 Competitors.

THREE SPRINGS AGRICULTURAL SOCIETY.

Three crops were submitted for inspection in the competition conducted by the Three Springs Agricultural Society, two of the variety Nabawa, and the other Merredin.

The rainfall for Three Springs was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Three Springs ...	...	...	22	76	106	541	288	110	80	103	1,228	5	21	1,352

The awards made are as follows:—

THREE SPRINGS AGRICULTURAL SOCIETY.

Judge: I. Thomas, Superintendent of Wheat Farms.

Competitor.	Address.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total, 100 points.
Hebiton, J. K ...	Three Springs	Nabawa ...	31	8	8	12	13	72
McKenzie, N. ...	do. ...	Merredin ...	27	9	8	13	13	70
Franklin, W. E. ...	do. ...	Nabawa ...	27	7	8	14	13	69

The winner's crop (Mr. J. K. Hebiton, sen.), of the variety Nabawa, was part of 80 acres of the same variety. It had been planted with a combined cultivator drill during the last week in April with 50 lbs. of re-cleaned seed which had not been treated for the prevention of the disease Ball Smut. Superphosphate was applied at 112 lbs. per acre. It was somewhat irregular in height and stooling and traces of the disease Ball Smut were noticed. Stray plants of barley and another variety were present. It gave promise of yielding well.

From an area of 160 acres of the variety Merredin, 50 acres were submitted by Mr. N. McKenzie, and this entry was awarded second prize. It was even in height, but somewhat irregular in stooling. It had been planted during the second week in May with 45 lbs. of graded pickled seed with 90 lbs. of superphosphate per acre. Traces of the disease Take-all and Flag Smut were noticed, as were also isolated plants of barley.

The cultural details of the methods employed by the different competitors are tabulated hereunder:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Implement.	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.									
Hebiton, J. K., Jnr	5th 2nd on fallow	York gum and salmon gum	Aug. and Sept.	Disc cultivating	3–4	Good	Springtyne cultivated Oct., Nov. and Jan. Planted with a combined cultivator drill.	Nabawa	Last week April	50	112	No	Re cleaned	Slight trace of Bali Smut and Septoria
McKenzie N.	4 crops 3 fallows	York gum, mallee and scrub	July	Disc cultivating	3½	Good	Rigid tyne cultivated, May. Planted with combined cultivator drill	Merredin	2nd week May	45	90	Copper carbonate	Yes	Traces Take all, Flag Smut and Loose Smut
Franklin, E. W.	1st crop after fallow and 6 years pasture	Salmon and morrel	July	Mould board	5	Good	Cross ploughed 4in. deep in September, part with mouldboard, part with disc. Springtyne cultivated prior to seeding.	Nabawa	3rd week April	60	90	Copper carbonate	Yes	A little Take-all Septoria

ROYAL AGRICULTURAL SOCIETY—ZONE 1.

In previous years no district Agricultural Society in this Zone provided for crop competitions. This year, however, in addition to those competitors nominating direct with the Royal Agricultural Society, the Three Springs District Agricultural Society conducted a local 50-acre Crop Competition, the winners of which were eligible and automatically became competitors for the Royal Agricultural Society's Zone prizes.

The rainfall recorded during the year for centres where the competing crops were grown was as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Coorow			118	165	53	628	326	157	94	101	1,359	8	5	1,65[illegible]
Three Springs			22	76	106	541	288	110	80	103	1,228	5	21	1,352
Moora			217	128	107	567	365	282	158	129	1,608	10	16	1,979
Carnamah			87	31	73	731	325	153	95	138	1,515	...	9	1,642

The awards made are as follow: —

ROYAL AGRICULTURAL SOCIETY - ZONE 1.

Judge: I. Thomas, Superintendent of Wheat Farms.

Competitor.	Address.	Society.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Bothe, B. D....	Coorow ...	Royal ...	Nabawa	35	8	8	14	13	78
Morcombe, P. T.	do. ...	do. ...	Felix ...	32	9	8	12	13	74
Hebiton, J. H.	Three Springs	Three Springs	Nabawa...	31	8	8	12	13	72
Roberts, J. A.	Moora ...	Royal ...	Nizam ...	32	7	8	13	13	71
McKenzie, N.	Three Springs	Three Springs	Merredin	27	9	8	13	13	70
Forrester, J. K.	Carnamah	Royal ...	do. ...	29	7	8	13	12	69
Cuming, A. S.	do. ...	do. ...	Nabawa...	25	7	8	11	11	62
Hopkinson, H. J.	Miling ...	do. ...	do. ...	16	9	9	13	10	57

The competing area of the winner, Mr. B. D. Bothe, of Coorow, was part of 80 acres of the variety Nabawa. It had been planted with a combined cultivator drill with harrows attached during the first week of May, with 55 lbs. of graded seed, together with 180 lbs. of superphosphate per acre. Sheep were depastured on it about the middle of June, which apparently had not checked its growth to any extent. At the time of inspection, despite its tall growth and slight bleaching of the straw, it had the appearance of a high yielding crop. It was fairly free from admixture and weed growth. Small isolated patches of the disease Take-all were noticed.

The 50 acres of the variety Felix, submitted by Mr. P. T. Morcombe, also of Coorow, was part of 80 acres of the same variety, and was awarded 2nd prize. It was of a nice even stripping height, and with the exception of scattered mustard plants, was fairly free of weeds. Stray plants of barley and traces of the disease Flag Smut and Rust were noticed. It had been planted during the second week in May with 60 lbs. of graded seed per acre with an application of 120 lbs. of superphosphate.

The cultural details relating to the competitors' crops in this competition are as follow:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.									
Rothe, E. D.	9th crop	Salmon and york gum	July	Mould-board	4	Good	Fed off with sheep till mid June. Disc cultivated Aug., Springtyne Sept. Disc cultivated before seeding. Planted with combined cultivator drill	Nabawa	1st week May	55	180	Copper carbonate	Yes	Trace Takeall
Morcombe, P. T.	6th crop 2nd on fallow	Salmon and gimlet	June	Disc cultivating	4	Good	Grazed with sheep at all times. Skim ploughed September. Springtyne cultivated March. Harrowed end April. Planted with combined cultivator drill	Felix	2nd week May	60	120	Copper carbonate	Yes	Traces and Smut — Rust Flag
Hebiton, J. K., junr.	5th crop 2nd on fallow	York gum and salmon gum	Aug. and Sept.	Disc	3-4	Good	Springtyne cultivated Oct., Nov. and Jan. Planted with combined cultivator drill	Nabawa	Last week April	50	112	No	Re-cleaned	Slight traces Ball Smut and Septoria
Roberts, J. A.	2nd crop both on fallow	Salmon gum	June	Mould-board	3-3½	Good	... ...	Nizam	1st week May	36	112	Copper carbonate	Yes	Traces and Smuts — Flag Loose
McKenzie, N.	4 crops 3 fallows	York gum, mallee and scrub	July	Disc cultivating	3½	Good	Rigid tyne cultivated May. Planted with combined cultivator with harrows attached	Merredin	2nd week May	45	90	Copper carbonate	Yes	Traces all, Smut, Loose — Takeall, Flag and Smut
Forrester, J. K.	6th crop 4th year on fallow	York gum (heavy)	June	Disc	3½	Good	Springtyne cultivated Sept. and Oct. Planted with combined cultivator drill	Merredin	Last week May	48	100	Copper carbonate	Yes	Traces and Smut Septoria — Ball Flag and
Cuming, A. S.	Cropped at least 6 years	Salmon, gimlet and tea-tree	June	Disc	3½	Good	Skim ploughed Aug. Harrowed Sept. Planted with a summer seeder and harrowed immediately after	Nabawa	2nd week April	60	150	Copper carbonate	Re-cleaned	Traces Smut, Takeall and Septoria — Ball Take- and Septoria
Hopkinson, H. J.	1st crop	Jam, wattle and tamma	July	Disc	5	Fairly good	Disc cultivated early March prior to seeding	Nabawa	Last week April	45	100	Copper carbonate	Yes	Slight traces Takeall Bunt and Septoria

ZONE 2.

Judge—F. L. SHIER, B.Sc. (Agric.), Agricultural Adviser.

Royal Society—1 Competitor.

Dalwallinu Society—9 Competitors.

Total—10 Competitors.

DALWALLINU AGRICULTURAL SOCIETY.

Nine crops were inspected in the competition conducted by the Dalwallinu Agricultural Society.

The rainfall for stations nearest the competitors was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Tota for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Dalwallinu	...	...	232	118	52	429	232	175	96	106	1,090	2	176	1,618
Ballidu	...	...	112	158	64	545	230	187	93	64	1,183	3	48	1,504
Kalannie	...	...	194	158	85	449	168	168	84	74	1,028	...	40	1,420

The awards were as hereunder:—

DALWALLINU AGRICULTURAL SOCIETY.

Judge: F. L. Shier, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from admixture. 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Sutcliffe, J. G. ...	Damboring ...	Gluclub ...	33	8	9	12	14	76
Butcher, A. J. ...	Pithara ...	Gluclub ...	32	9	9	12	13	75
Locke, F. C. ...	Dalwallinu ...	Merredin ...	30	8	9	14	13	74
Bradford Bros. ...	Damboring ...	Gluyas Early	29	9	8	14	14	74
Martin, K. J. ...	Dalwallinu ...	Ford ...	30	8	8	13	13	72
Georgey, C. H. ...	Kalannie ...	Nabawa ...	26	9	9	13	13	70
Bellby, J. ...	Ballidu ...	Gluyas Early	26	9	9	13	12	69
Browning, G. W.	Pithara ...	Gresley ...	26	9	9	10	13	67
Whittingham, A. G. & A. J.	Pithara ...	Canberra ...	26	8	7	12	13	66

The first prize winner, Mr. J. G. Sutcliffe's entry of Gluclub, was estimated to yield 33 bushels per acre. It was fairly free from weeds, well headed and even, but contained a few strange heads.

The second prize was secured by Mr. A. J. Butcher's entry, also of Gluclub. It was well headed, fairly free from weeds, but contained a trace of Take-all. It was estimated to yield 32 bushels per acre.

Below is a table showing the cultural details adopted by the various competitors:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Nutcliffe, J. G.	15	Salmon, gimlet and morrel	June	Disc	In. 3½	Springtyne cultivated Sept. and October	Gluclub	End April ...	38	90	Copper carbonate	Yes	
Fletcher, A. J.	7–8	Salmon, gimlet and morrel	July–Aug.	Disc	3½	Springtyne cultivated Sept. and again March	Gluclub	End April ...	45	112	Copper carbonate	Yes	Patches of Takeall
Locke, F. C. ...	17	Salmon and gimlet	June	Mouldboard	4	Springtyne cultivated Aug. and Sept.; harrowed Oct.; springtyne cultivated before drill	Merredin	End April feal off	45	112	Copper carbonate	Yes	Takeall
Crawford Bros.	7	Salmon, gimlet and morrel	June–July	Mouldboard Disc	4	Springtyne cultivated Sept. and again summer. Planted with combined cultivator drill	Ghyas Early	Mid-May ...	50 55	90	Copper carbonate	Yes	Trace Flag Smut
Martin K. J.	8–10	Salmon and morrel	July	Mouldboard	3½	Springtyne cultivated and rolled end September	Port	End April ...	50	80	Copper carbonate	Yes	Takeall
Georgey, C. H.	3	Salmon and morrel	July	Disc	3½	Sundercut February	Nabawa	Beginning April	45	90	Copper carbonate	Yes	
Reilby, J. ...	4–5	Gimlet and morrel	July	Disc	3½	Springtyne cultivated twice prior drilling	Ghyas Early	Early May ...	60	112	Copper carbonate	Yes	
Browning, G. W.	Unknown	Salmon and gimlet	July	Disc	3½	Springtyne cultivated Sept. and before seeding	Gresley	Mid-April ...	50	80	Copper carbonate	Yes	
Whittingham, A. G. & A. J.	4	Morrel and gimlet	July	Disc	2½	Springtyne cultivated Sept. and before seeding	Canberra	1st week May...	55	90	Copper carbonate	Yes	Trace Flag Smut

ROYAL AGRICULTURAL SOCIETY—ZONE 2.

The competitors in this competition include an entry made direct with the Royal Agricltural Society and the first and second prize winners in the Dalwallinu Agricultural Society's crop competition. The awards were as hereunder:—

ROYAL AGRICULTURAL SOCIETY—ZONE 2.

Judge: F. L. Shier, B.Sc., Agric., Agricultural Adviser.

Competitor.	District.	Society.	Variety.	Yield. 50 pts.	Freedom from weeds. 10 pts.	Freedom from Disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth 15 pts.	Total 100 pts.
Sutcliffe, J. G.	Damboring...	Dalwallinu ...	Gluclub	33	8	9	12	14	76
Butcher, A. F.	Pithara ...	Dalwallinu ...	Gluclub	32	9	9	12	13	75
Porter, F. A. ...	Ajana ...	Royal ...	Nabawa	18	9	9	13	14	63

The winner of this competition also won the Dalwallinu competition.

The rainfall for Ajana and Dalwallinu is shown in the following table:—

——	Jan	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July	Aug.	Sep.	Oct.	Total.			
Ajana ...	...	...	51	90	99	653	208	150	68	67	1,245	9	10	1,405
Dalwallinu ...	...	...	232	118	52	429	232	175	96	106	1,090	2	176	1,618

The cultural details are summarised hereunder:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Sutcliffe, J. G.	15	Salmon, gimlet and morrel	June	Disc	in. 3½	Springtyne cultivated Sept. and October	Gluclub	End April ...	38	90	Copper carbonate	Yes	
Butcher, A. J.	7–8	Salmon, gimlet and morrel	July–Aug.	Disc	3½	Springtyne cultivated Sept. and and again March	Gluclub	End April ...	45	112	Copper carbonate	Yes	Patches of Takeall
Porter, F. A....	1st fallow	York gum	July	Disc	3	Disc cultivated during February	Nabawa	End April ...	50	112	Copper carbonate	Re-cleaned	

ZONE 3.

Judge—A. S. WILD, B.Sc.(Agric.), Agricultural Adviser.

Royal Society—1 competitor.

Wongan Hills Society—

Light land—6 competitors.

Heavy land—5 competitors.

Dowerin Society—10 competitors.

Wyalkatchem Society—9 competitors.

Total—31 competitors.

WONGAN HILLS AGRICULTURAL SOCIETY.

The Wongan Hills Agricultural Society conducted their 50-acre crop competition in two sections, for heavy and light land respectively—the classification of the competitors being made by the Society. It is pleasing to note that there were no withdrawals from either section, all entries being submitted for inspection.

The awards made in both sections are as follow:—

WONGAN HILLS AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

HEAVY LAND.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Mt. Rupert Co. ...	Wongan Hills	Merredin ...	35	9	8	13	14	79
Lane Bros. ...	do. ...	Ford ...	32	9	9	14	13	77
Ackland, J. H. ...	do. ...	Nabawa ...	31	9	8	14	13	75
McPharlin, G. A.	do. ...	Daphne ...	29	9	9	14	13	74
Fowler, G. F. ...	do. ...	Baroota Wonder	32	8	8	12	12	72
Robinson, J. & Sons	do. ...	Gresley ...	28	8	8	13	13	70

LIGHT LAND.

Competitor.	District.	Variety.	Yield 50 pts.	Freedom from weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of growth, 15 pts.	Total 100 pts.
Glenvor Pastoral Co.	Wongan Hills	Nabawa ...	32	9	9	14	14	78
Millsteed, W. H.	do. ...	Nabawa ...	26	9	9	14	13	71
Roberts, I. B. ...	do. ...	Nabawa ...	25	9	9	13	13	69
Robinson, J. & Sons	do. ...	Gluclub ...	23	9	9	13	13	67
Millsteed Bros.	do. ...	Doller ...	21	9	8	13	13	64

In the heavy land section the Mt. Rupert Co.'s crop of the early variety Merredin secured first place, with a total of 79 points, the calculated yield being 35 bushels. This crop was grown on country which originally carried salmon, morrel and gimlet timber. The land had been ploughed to a depth of 4 inches with a mouldboard plough early in September. As would be expected, the condition of the land at this time was somewhat hard. In the same month the land was harrowed and then spingtyne cultivated. The harrowing was repeated in early November after rain and the springtyne-cultivation in early May. Subsequently the crop was planted with a combined cultivator-drill and harrowed immediately after. The seed was applied at the rate of 60 lbs. and the superphosphate at 80 lbs. per acre.

The light land section showed some very fine crops for this class of country. The Glenvor Pastoral Co.'s crop of Nabawa, calculated to yield 32 bushels per acre, was a very attractive one, being very free of weeds, disease or admixture, and even in growth. It had been planted at the end of April, at the rate of 48 lbs. of graded seed, with 150 lbs. of superphosphate per acre. The land, which was scrub-plain, had been ploughed with a disc plough to a depth of 4 inches during July of the previous year. It had been left in an open state until just before seeding, when it was disced to a depth of 2½ inches.

These cultivations are typical of those employed by all the competitors in this light land section of the competition.

The monthly rainfalls recorded at Wongan Hills throughout the year are shown hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Wongan Hills ...	...	...	95	117	92	477	275	192	66	57	1,159	...	153	1,524

The cultural details of the crops competing in both the heavy and light land sections set out in the following tables:—

CULTURAL DETAILS.

Heavy Land.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.								
Mt. Rupert Co.	Old land	Salmon, morrel and gimlet	Early Sept.	Hard	Mould-board	4	Harrowed and springtyned cultivated Sept. Harrowed early Nov. Springtyne cultivated early May. Planted with combined cultivator drill and harrowed	Merredin	End May ...	60	80	Copper carbonate	Yes	Trace Ball Smut
Lane Bros. ...	6	Salmon and gimlet	Aug.	Good	Mould-board	4	Harrowed Aug. Springtyned cultivated Sept. and April. Planted with combined cultivator drill and harrowed	Ford	Mid May ...	60	120	Copper carbonate	Yes	Traces Take-all
Ackland, J. H.	4	Salmon and gimlet, and portion morrel	June	Good	Mould-board	4	Springtyned cultivated Sept., and prior to seeding. Planted with combined cultivator drill	Nabawa	Mid May ...	50	120	Copper carbonate	Yes	Trace Take-all
McPhartlin, I. A.	3	Chiefly salmon	Late Sept.	Hard	Disc	2½–3	Springtyned cultivated end Oct. and harrowed just after. Planted with combined cultivator drill with light harrows afterwards	Daphne	Mid April ...	45	90	Copper carbonate	Yes	Trace Takeall
Fowler, G. F.	Old land	Salmon and gimlet	July	Fair	Mould-board	4	Planted with combined cultivator drill with light harrows attached	Baroota Wonder	Mid April ...	50	90	Copper carbonate	Yes	Takeall
Robinson, J. & Sons	Half old land, half 2nd crop	Salmon, morrel and yorkrum	May and July	Good	Mould-board	4	Springtyned cultivated March. Planted with hoe drill	Gresley	Mid April ...	60	80	Copper carbonate	Yes	Traces Takeall and Flying Smut.

CULTURAL DETAILS.

Light Land.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.								
Glenvor Pastoral Co.	1	Scrubplain	July	Good	Disc	4	Disc cultivated 2½in. deep prior to seeding	Nabawa	End April ...	48	150	No	Yes	
Millsteed, W. H.	2	Sandplain	Sept.	Good	Disc.	3	Disc cultivated 2in. deep prior to seeding	Nabawa	End April ...	45	112	Copper carbonate	Yes	Trace Takeall.
Roberts, I. B.	1	Sandplain	Sept.	Wet	Mould-board	4½	Disc cultivated 2½in. deep prior to seeding	Nabawa	Mid April ...	60	112	Copper carbonate	Re-cleaned	
Robinson, J. & Sons	2	Scrubplain	July	Good	Mould-board	4	Springtyne cultivated prior to seeding	Gluclub	2nd week April	60	140	Copper carbonate	Yes	
Millsteed Bros.	1	Sandplain	Aug.	Good	Disc	4-5	Disc cultivated 2½in. prior to seeding	Dollar	End April ...	45	112	Copper carbonate	Yes	Traces takeall, Ball Smut and Flying Smut.

DOWERIN AGRICULTURAL SOCIETY.

Ten crops were submitted for inspection in this society's competition. Awards were made as follow:—

DOWERIN AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total 100 pts.
Williams, G. ...	Hindmarsh ...	Waratah ...	32	9	8	14	14	77
Bear, H. E. ...	Minnivale ...	Canberra ...	30	9	9	14	14	76
Cosh, E. C. ...	Minnivale ...	Waratah ...	32	9	8	13	13	75
Hughes, J. R. ...	Minnivale ...	Nabawa ...	28	8	9	14	13	72
Anderson, J. S....	Dowerin ...	Pusa ...	29	8	8	13	13	71
Kelly, W. ...	Dowerin ...	Nabawa ...	25	8	9	13	13	68
Jones, A. ...	Ejanding ...	Nabawa ...	23	9	8	14	13	67
Cook, E. ...	Dowerin ...	Gluyas Late	23	9	8	13	13	66
Kelly, W. ...	Dowerin ...	Nabawa ...	21	9	9	13	14	66
Thomas, T. ...	Dowerin ...	Nabawa ...	20	9	9	14	14	66

Mr. G. Williams was again successful in securing first place. His crop, of the variety Waratah, was calculated to yield 32 bushels per acre, and gained 77 points. This was a good, even, well-headed crop. The weeds were confined to a few wild oats, the disease to traces of Take-all and Flag Smut, and the admixture to odd plants of barley.

The land had been previously prepared by ploughing in the previous July to a depth of 4 inches. Subsequently it was springtyne cultivated in September, and again in early May. The crop was planted during the last week in May with a combined cultivator-drill, 50 lbs. of dry-pickled ungraded seed being applied per acre, together with 75 lbs. of superphosphate.

The rainfalls, as recorded at the various centres in the Dowerin district during the year, were as follow:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Dowerin	...	...	71	117	57	393	328	264	76	40	1,158	3	140	1,489
Ejanding	...	...	26	135	53	301	237	150	46	18	805	5	93	1,064
Minnivale	...	25	163	102	47	401	264	186	77	29	1,004	...	101	1,395

The cultural details of the competitors are summarised below:—

CULTURAL DETAILS

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.								
Williams, G	10	Salmon and gimlet	July	Good	Disc	4	Springtyne cultivated early Sept. and early May. Planted with combined cultivator drill with light harrows attached	Waratah	4th week May	50	75	Copper carbonate	No	Traces of Takeall and Flag Smut
Bear, H. E. ...	Old land	Salmon, morrel and odd gimlet	July	Good	Disc	3	Rigid-tyne cultivated Sept. Harrowed early Nov. Rigid-tyne cultivated May. Planted with combined cultivator drill with light harrows attached	Canberra	Mid May	50	80	Copper carbonate	Recleaned	Trace of Flag Smut
Cosh, E. C. ...	3	Salmon gimlet, and clay bush	July	Good	Disc	3	Springtyne cultivated end Aug. and Sept. Planted with combined cultivator drill	Waratah	4th week April	45	100	Copper carbonate	Recleaned	Traces of Flag Smut and Ball Smut
Hughes, J. R	Old land	Gimlet and salmon	July	Good	Mould-board	4	Disc cultivated 2in. deep Sept. Rigidtyne cultivated 1st week May. Planted with combined cultivator drill with light harrows attached	Nabawa	2nd week May	45	100	Copper carbonate	Yes	Trace of Takeall
Anderson, L. S.	Old land	Morrel and gimlet	Late July	Fair	Mould-board	3½	Harrowed twice Sept. Springtyne cultivated prior to seeding. Planted with combined cultivator drill and harrowed immediately after	Pusa	2nd and 3rd weeks June	45	90	Copper carbonate	Yes	Traces of Flag Smut and Takeall
Kelly, W. ...	Old land	Salmon and gimlet	July	Good	Mould-board	4	Disc cultivated 2in. deep Sept., and before seeding	Nabawa	End March	70	120	Copper carbonate	Yes	Trace of Takeall
Jones, A. ...	4	Sandplain and scrub	June	Good	Disc	3½	Harrowed three times and cultivated just after ploughing	Nabawa	2nd and 3rd weeks April	45-50	120	Copper carbonate	Yes	Trace of Ball Smut

CULTURAL DETAILS.—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Cook, E. ..	Old land	Salmon and gimlet	July	Good	Mould-board.	in. 3½	Springtyne cultivated Oct. Disc cultivated 2in. deep before seeding	Gluyas Late	2nd week June	60	80	Blue-stone	Yes	Traces of Takeall and Flag Smut in admixture
Kelly, W. ...	1	Tussocky sandplain	July and Aug.	Good	Disc	3	Disc cultivated 2in. deep in March	Nabawa	1st and 2nd weeks April	40	140	Copper carbonate	Yes	
Thomas, T. ...	4	Tussocky sandplain	Late July and early Aug.	Good	Disc	2½	Disc cultivated 1½in. deep before seeding	Nabawa	1st week May	37	90	Copper carbonate	Yes	

WYALKATCHEM AGRICULTURAL SOCIETY.

All of the nine crops entered for the Wyalkatchem Agricultural Society's competition were inspected. The following awards were made:—

WYALKATCHEM AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

	District.	Variety.	Yield 50 pts.	Freedom from weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Jones, W. W. ...	Cowcowing ...	Nabawa ...	31	9	9	12	14	75
Lehman, C. E. ...	Cowcowing ...	Gluclub ...	31	9	8	12	14	74
Hodgson, H. ...	North Korrelocking	Merredin ...	31	8	7	13	14	73
Vernon Estate ...	Nembudding ...	Ford ...	28	9	8	13	13	71
Lockyer, J. B. ...	Dukin	Gluyas Early	26	9	8	13	14	70
Chester & Sons ...	Wyalkatchem...	Nabawa ...	26	8	9	12	14	69
Robinson, S. W.	Cowcowing ...	Merredin ...	23	9	8	13	14	67
Tyler, J. E. ...	Korrelocking ...	Nabawa ...	23	9	9	13	13	67
Wilson, T. H. ...	Wyalkatchem...	Nabawa ...	25	7	9	14	12	67

Three competitors gained yields calculated at 31 bushels per acre. Of these Mr. W. W. Jones was placed first. The winning crop lost points through admixture, but the growth was even, it was comparatively free of weeds, and, except for Flag Smut in admixture, was free of disease.

The rainfalls, as recorded at the various centres in the district, are shown hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Cowcowing ...	...	...	151	160	47	395	196	136	44	36	854	7	80	1,252
Korrelocking ...	...	15	63	147	42	363	237	181	70	37	930	7	...	1,162
Wyalkatchem ...	...	56	53	135	63	335	247	161	68	27	901	7	100	1,252

The cultural details of the competitors are summarised hereunder:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate o superp	Seed treatment.	Graded.	Disease.
						in.								
Jones W. W.	3	Salmon and gimlet	June and July	Good	Disc	4	Disc cultivated 4in. deep early Aug.; drilled with combined cultivator drill with light harrows attached	Nabawa	Mid-April ...	45	7	Copper carbonate	Yes	Trace of Flag Smut in admixture
Lehman, C. E.	4	Morrel, Salmon and mallee	June	Excellent	Disc	4	Springtyne cultivated Sept.; drilled with combined cultivator drill	Gluclub	Mid-May ...	37	90	Copper carbonate	Yes	Trace of Flag Smut; trace Bunt in admixture
Hodgson, H....	Old land	Salmon, gimlet and mallee	June & early July	Good	Mouldboard	4	Disc cultivated 2½in. deep Aug.; springtyne cultivated Oct.; drilled with combined cultivator drill with light harrows attached	Merredin	2nd week May...	4	90	Copper carbonate	Re-cleaned	Traces of Flag Smut, Ball Smut, Flying Smut and Takeall
Vernon Estate	4	Gimlet running to tea-tree	March, 1929	Fair	Disc	3	Mouldboard ploughed June, 1929, 4in. deep; disc cultivated 2in. deep Sept.; springtyne cultivated twice Mar.; harrowed April	Ford	End April ...	45	90	Copper carbonate	Yes	Traces of Flag Smut and Takeall
Lockyer, J. B.	3	Morrel, Salmon and some gimlet	June and July	Excellent	Disc	4	Springtyne cultivated end Aug.; harrowed Sept. and Nov.; drilled with combined cultivator drill followed by harrows	Gluyas Early	End April ...	45	100	Copper carbonate	Re-cleaned	Traces Ball Smut and Flag Smut
Chester, S. C., & Sons	Old land	Gimlet ...	Early June	Good	Mouldboard	3¼	Rigid tyne cultivated early Aug.; spring tyne cultivated late Aug.; harrowed Oct.; springtyne cultivated Mar.; rigid-tyne cultivated April. Planted with combined cultivator drill with harrows attached	Nabawa	End April ...	45	100	Copper carbonate	Yes	Trace Flying Smut

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						In.								
Robinson, S. W.	6	Salmon and gimlet	Early July	Good	Disc	4	Disc cultivated 2in. deep Aug.; springtyne cultivated March. Planted with combined cultivator drill with light harrows attached	Merredin	End April ..	50	90	Copper carbonate	Yes	Trace Bail Smut and Flag Smut
Tyler, J. E. ...	10	Chiefly salmon with yorkgum, mallee and gimlet mixed	June	Excellent	Mouldboard	4	Disc cultivated 2in. deep Aug.; springtyne cultivated early Sept., harrowed end Sept.; springtyne cultivated and harrowed prior seeding. Planted with combined cultivator drill with light harrows attached	Nabawa	2nd week May	45	120	Copper carbonate	Yes	
Wilson, T. H.	Old land	Portion gimlet and portion scrub	August	Wet	Mouldboard	4	Disc cultivated late Sept.; harrowed Oct.; disc cultivated before seeding	Nabawa	3rd week April	50	100	Copper carbonate	Yes	

ROYAL AGRICULTURAL SOCIETY—ZONE 3.

The competitors in this competition comprise the first and second prize winners in the Wongan Hills, Dowerin and Wyalcatchem Agricultural Societies' crop competitions, together with an entry received direct by the Royal Agricultural Society.

The awards made were as follow:—

ROYAL AGRICULTURAL SOCIETY.

ZONE 3.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield 50 pts.	Freedom from weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Mt. Rupert Co. ...	Wongan Hills...	Merredin ...	35	9	8	13	14	79
Glenvor Pastoral Co.	Wongan Hills...	Nabawa ...	32	9	9	14	14	78
Williams, G. ...	Dowerin ...	Waratah ...	32	9	8	14	14	77
Bear, H. E. ...	Dowerin ...	Canberra ...	30	9	9	14	14	76
Jones, W. W. ...	Wyalkatchem...	Nabawa ...	31	9	9	12	14	75
Fordham, N. A.	Royal	Waratah ...	31	8	9	13	13	74
Lehman, C. E. ...	Wyalkatchem...	Gluclub ...	31	9	8	12	14	74

The competition was won by the Mt. Rupert Co., Wongan Hills, with a crop of Merredin, estimated to yield 35 bushels per acre.

The rainfall for the year was as hereunder:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Wongan Hills ...	...	...	95	117	92	477	275	192	66	57	1,159	...	153	1,524
Dowerin	...	...	71	117	57	393	328	264	76	40	1,158	3	140	1,489
Wyalkatchem ...	...	56	53	135	63	335	247	161	68	27	901	7	100	1,252
Calingiri	...	16	68	91	101	424	395	274	161	46	1,401	16	60	1,652

The cultural details are as follow:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of supe.	Seed treatment.	Graded.	Disease.
						in.								
Mt. Rupert Co.	Old land	Salmon, morrel and gimlet	Early Sept.	Hard	Mould-board	4	Harrowed and springtyne cultivated Sept.; harrowed early Nov.; springtyne cultivated early May. Planted with combined cultivator drill and harrowed after	Merredin	End May ...	60	80	Copper carbonate	Yes	Trace Ball Smut
Glenvor Pastoral Co.	1	Scrub plain	July	Good	Disc	4	Disc cultivated 2½in. deep prior to seeding	Nabawa	End April ...	48	150	Untreated.	Yes	
Williams, G. ...	10	Salmon and gimlet	July	Good	Disc		Springtyne cultivated early Sept. and May. Planted with combined cultivator drill with light harrows attached	Waratah	4th week May	50	75	Copper carbonate	No	Trace Flag Smut
Bear, H. E. ...	Old land	Salmon, morrel and odd gimlet	July	Good	Disc	3	Rigid tyne cultivated Sept.; harrowed early Nov.; rigid tyne cultivated May Planted with combined cultivator drill with light harrows attached	Canberra	Mid-May ...	50	80	Copper carbonate	Re-cleaned	Trace Flag Smut
Jones, W. W.	3	Salmon and gimlet	June–July	Good	Disc	4	Disc cultivated 4in. deep early Aug. Planted with combined cultivator drill with light harrows attached	Nabawa	Mid-April ...	45	75	Copper carbonate	Yes	Trace Flag Smut in admixture
Fordham, N. A.	Old land	Salmon, jam and tamma	Early Aug.	Fair	Mould board	4	Springtyne cultivated prior seed. Planted with hoe drill	Waratah	Mid April ...	60	150	Copper carbonate	Yes	Trace of Take-all
Lehman, C. E.	4	Morrel, salmon and mallee	June	Excellent	Disc	4	Springtyne cultivated Sept.; drilled with combined cultivator drill	Gluclub	Mid-May ...	37	56	Copper carbonate	Yes	Traces Flag Smut and Bunt admixture

ZONE 4.

Judge—G. L. Throssell, Dipl. Agric., Agricultural Adviser.

Royal Society—5 competitors.

Mt. Marshall Society—4 competitors.

Nungarin Society—12 competitors.

Total—21 competitors.

MT. MARSHALL AGRICULTURAL SOCIETY.

Only four entries were received in this competition, and all were submitted for inspection. The points awarded were as follows:—

Mt. MARSHALL AGRICULTURAL SOCIETY.

Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Thompson, M. A.	North Bencubbin	Nabawa ...	24	8	9	13	13	67
Collins, M. C. ...	Bencubbin ...	do. ...	24	8	8	13	13	66
Hopwood, B. W. G.	do. ...	do ...	23	9	8	13	12	65
Wendt, E. ...	Welbungin ...	Gluyas Early	21	8	8	12	14	63

A crop of Nabawa, calculated to yield 24 bushels per acre, submitted by Mr. M. A. Thompson, of North Bencubbin, won the competition with an award of 67 points. This crop was on land which had been ploughed 4 inches deep in July with a disc implement, and which had received two workings with a spring-tyne cultivator, viz., August, and prior to seeding. It was planted with a combined cultivator drill at the end of April, seed being applied at the rate of 38 lbs. and superphosphate 118 lbs. per acre.

Only one point separated the second prize winner, Mr. W. C. Collins, whose crop of Nabawa, although estimated would yield the same as the winning crop, lost a point for the presence of Septoria.

The rainfall during the year was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep	Oct.	Total.			
North Bencubbin ...	...	6	173	241	47	480	169	164	64	15	939	...	62	1,421
Bencubbin	...	21	17	219	58	447	193	128	74	18	918	2	34	1,211

The cultural details are set out hereunder:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed	Rate of super	Seed treatment	Graded.	Disease.
					In.					lb.	lb.			
Thompson, M. A.	...	Salmon and gimlet	July	Disc	4	Good	Springtyne cultivated Aug., Nov. and prior to seeding. Planted with combined cultivator drill	Nabawa	End April ...	38	118	Copper carbonate	Yes	Takeall
Collins, M. C.	...	Salmon and gimlet	June	Mould-board	4	Good	Disc harrowed Sept. and prior to seeding; planted with combined cultivator drill	Nabawa	End April ...	47	60	Copper carbonate	Yes	Takeall Septoria
Hopwood, E. W. G.	Unknown. Cleared 1909	Gimlet, mallee and jam scrub	July Aug.	Disc	4	Fairly good	Springtyne cultivated in Sept. and Nov.; planted with combined cultivator drill	Nabawa	1st week May	45	120	...	Yes	Takeall Septoria
Wendt E. ...	Unknown, cleared 1912	Salmon, gimlet and morrel	July. Aug.	Disc	3	Dry	Cultivated with a combined cultivator drill in April; planted with same implement	Gluyas Early	Mid-May ...	39	70	Copper carbonate	Yes	Flag Smut

NUNGARIN AGRICULTURAL SOCIETY.

Of the fifteen entries in this competition, twelve were submitted for judging, the awards being as follow:—

NUNGARIN AGRICULTURAL SOCIETY.

Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Manuel, C. J. ...	Mukinbudin	Gluyas Early	30	8	9	14	14	75
Watson Bros. ...	Nungarin ...	Carrabin ...	31	9	8	13	13	74
Johnson, J. H. ...	Mangowine	Gluyas Early	30	9	8	12	14	73
Williams, F. A. ...	do. ...	Nabawa ...	29	8	8	14	14	73
Clamp, A. ...	Mukinbudin	Gluyas Early	29	9	8	13	13	72
Creagh Bros. ...	Kweikan ...	Carrabin ...	27	9	8	13	13	70
Jolly, H. P. ...	Mangowine	Nabawa ...	28	9	7	13	13	70
Waterhouse, H. H.	Nungarin ...	do. ...	27	8	8	13	13	69
Richardson, J. ...	Mukinbudin	do. ...	26	9	7	12	14	68
Pope Bros. ...	Kununoppin	Gluyas Early	24	8	8	14	14	68
Philbey, J. G. ...	Nungarin ...	Ford ...	24	9	7	12	14	66
Reynolds, A. G. ...	Mukinbudin	Gluyas Early	24	9	8	13	12	66

Mr. C. J. Manuel, of Mukinbudin, was the successful competitor, his entry being a very fine crop of Gluyas Early, which was estimated to yield 30 bushels per acre.

The land on which the crop was grown originally carried a forest of salmon gum and gimlet. It was ploughed during July with a mouldboard to a depth of 3½ inches, and was springtyne cultivated in August and prior to seeding, which took place during the first week in May, a disc drill being used. Seed and superphosphate were applied at the respective rates of 52 lbs. and 75 lbs. per acre.

The crop was a tall, dense and very even one, and, with the exception of a little barley grass, was free of weeds, while only a trace of Flag Smut was noticed.

It will be observed that 52 lbs. of graded seed were sown per acre. This is heavier than the usual rate recommended for this area, and while the object of sowing thickly was to overcome barley grass, the thick seeding had a detrimental effect towards the end of the growing season, when the spring rains were very light. Thus, while the crop was a very fine one, it did not yield as well as it looked. For the Mukinbudin district it is not considered advisable to exceed 40 lbs. per acre, and farmers should refer to the results of the experiments conducted at the Yilgarn Experiment Farm.

The rainfall, as recorded at the various centres in this competition, was as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total for year
Mukinbudin ...	...	6	62	249	36	397	142	174	128	16	893	5	66	1,281
Nungarin ...	...	24	204	230	64	324	196	155	80	21	840	1	101	1,400
Kununoppin ...	...	13	175	191	47	306	192	172	123	25	865	2	43	1,289

The cultural details are as hereunder:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.									
Manuel, C. J.	...	Salmon and gimlet	July	Mould-board	3½	Good	Springtyne cultivated Aug. and prior seeding; planted with disc drill	Gluyas Early	1st week May ...	52	72	Copper carbonate	Yes	Trace Flag Smut
Watson Bros.	Unknown; cleared 1912	Salmon and gimlet	July	Disc	4	Good	Reploughed Sept.; cultivated with combine cultivator drill Oct. and March, and planted with same implement	Carrabin	3rd week April...	48	90	Copper carbonate	Yes	Flag Smut and Takeall
Johnson, J. H.	4	Salmon and gimlet	June–July	Disc	4	Good	Springtyne cultivated July and Aug.; scim ploughed Sept.: harrowed Sept. and Nov.; springtyne cultivated Mch., and planted with combined cultivator drill	Gluyas Early	Mid-May ...	60	80	Copper carbonate	Yes	Flag Smut
Williams, F. A.	6	Salmon and gimlet	June	Rigid-tyne scarifier	3½	Good	Rigid-tyne scarified and harrowed Sept. and Nov.: harrowed Mch. Planted with a combined cultivator drill	Nabawa	End April ...	45	75	Copper carbonate	Yes	Takeall and trace Flag Smut
Clamp, A. ...	4	Salmon and gimlet	June	Disc	4	Good	Cultivated with a combined cultivator drill July, Sept. and March; harrowed Sept. Planted with combined drill cultivator	Gluyas Early	Mid-May ...	50	60	Copper carbonate	Yes	Flag Smut and Takeall
Creagh Bros ...	Unknown; cleared 1920	Salmon and gimlet	June July	Disc	4	Good	Springtyne cultivated Aug., Oct.-Nov. and Mar. Planted with a combined cultivator drill	Carrabin	Mid-May ...	45	95	Copper carbonate	Yes	Takeall and trace Flag Smut
Jolly, H. P....	...	Salmon, gimlet, morrel and mallee	July	Mould-board	3–4	Good	Harrowed Sept and March. Planted with combined cultivator drill	Nabawa	End April ...	45	65	Copper carbonate	Yes	Ball Smut and Takeall

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.									
Waterhouse, H. H.	Unknown; cleared 1913	Salmon and gimlet	July	Mould board	4	Good	Reploughed with disc Aug.; springtyne cultivated Nov. and March. Planted with a combined cultivator drill	Nabawa	2nd week April	45	85	...	Yes	Takeall
Richardson, J.	4	Salmon and gimlet	June-July	Mould board	3 4	Good	Planted with a combined cultivator drill	Nabawa	1st week May ...	45	75	Copper carbonate	Yes	Ball Smut and Takeall
Pope Bros. ...	Unknown: cleared 1917	Salmon, and gimlet and morrel	June	Mould-board	4	Good	Disc cultivated Sept.; springtyne cultivated and harrowed March. Planted with combined cultivator drill	Gluyas Early	End April ...	45	80	Copper carbonate	Yes	Trace Takeall and Flag Smut
Philbey, J. G.	Unknown: cleared 1913	Salmon and gimlet	July	Disc	3	Good	Reploughed end Sept springtyne cultivated end Feb. Planted with combined cultivator drill	Ford	Mid-May ...	45	110	Copper carbonate	Yes	Flag Smut
Reynolds A. G.	1st	Mallee jam scrub, tea-tree and white gum	June	Disc	4	Good	Cultivated with combined cultivator drill Aug. and Mar. Planted with same implement	Gluyas Early	Mid-May ...	45	90	Copper carbonate	Yes	Flag Smut

ROYAL AGRICULTURAL SOCIETY—ZONE 4.

The competitors in this competition include the first and second prize winners in the Nungarin and Mt. Marshall District Agricultural Societies' crop competitions, together with the entries made direct with the Royal Agricultural Society. There were five of these individual entries, and they were located at such widely distributed localities as Corinthian, Southern Cross, Dulyalbin, Trayning, and Mukinbudin.

The awards were as follow:—

ROYAL AGRICULTURAL SOCIETY—ZONE 4.

Judge: G. L. Throssell, Dipl., Agric., Agricultural Adviser.

Competitor.	District.	Society.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total 100 points
Manuel, C. J.	Mukinbudin	Nungarin...	Gluyas Early	30	8	9	14	14	75
Watson Bros.	Nungarin...	do. ...	Carrabin	31	9	8	13	13	74
Davies, R.E.R.	Southern Cross	Royal ...	Nabawa...	29	9	9	13	13	73
Smeeton, F. ...	Trayning...	do. ...	Ford ...	27	9	8	13	13	70
White, E. T....	Mukinbudin	do. ...	Nabawa...	26	9	9	12	13	69
Davies, F. & J.	Corinthian	do. ...	do. ...	26	9	9	13	12	69
Thompson, M. A.	North Bencubbin	Mt. Marshall	do. ...	24	8	9	13	13	67
Collins, M. C.	Bencubbin	do. ...	do. ...	24	8	8	13	13	66
Suiter, R. J. ...	Dulyalbin	Royal ...	do. ...	20	9	9	14	12	64

Mr. C. J. Manuel, of Mukinbudin, was, therefore, successful in winning the Zone Championship prize, with Messrs. Watson Bros., of Nungarin, filling the second place.

The rainfall recorded at the various centres is shown in the accompanying table:—

	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sep.	Oct	Total.	Nov.	Dec.	Total for year.
Mukinbudin		6	62	249	36	397	142	174	128	16	893	5	66	1 281
Nungarin		24	204	230	64	324	196	155	80	21	840	1	101	1,400
Corinthian		4	55	191	90	347	126	155	55	23	796	30	77	1,153
Turkey Hill		...	45	228	150	278	101	153	46	...	728	4	201	1,206
Trayning		17	191	162	60	343	216	136	58	21	834	...	90	1,294
Dulyalbin		...	...	...	34	348	204	174	89	19	868	15	34	917

The cultural details of the competitors are summarised in the following table:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed Treatment.	Graded.	Disease.
					in.					lb.	lb.			
Manuel, C. F.	...	Salmon and gimlet	July	Mould-board	3½	Good	Springtyne cultivated Aug., and prior to seeding. Planted with a disc drill	Gluyas Early	1st week May...	52	72	Copper carbonate	Yes	Trace Flag Smut
Watson Bros.	Unknown cleared 1912	Salmon and gimlet	July	Disc	4	Good	Re-ploughed Sept. Cultivated with a combined cultivator drill Oct. and Mar., and planted with same implement	Carrabin	3rd week April	48	90	Copper carbonate	Yes	Trace Flag Smut and Takeall
Davies, R. E. R.	1st	Salmon, gimlet and mallee	June-July	Disc	4	Good	Cultivated with combined cultivator drill Sept. and planted with same implement	Nabawa	1st week April	30	75	Copper carbonate	Yes	
Smeeton, F.	3	Salmon, gimlet and mallee	July	Disc	3½–4	Good	Cultivated with disc Oct., springtyne cultivated Oct. Planted with combined cultivator drill	Ford	3rd week April	45	75	Copper carbonate	Yes	Flag Smut, Takeall
White, E. T.	...	Salmon and gimlet	June	Disc	4	Good	Cultivated with disc Aug.; springtyne cultivated Sept. Oct., and April. Planted with a disc drill	Nabawa	Mid-April ...	45	95	Copper carbonate	Yes	
Davies F. & J.	1st	Salmon gimlet and mallee	July	Disc	4	Good	Cultivated with a combined cultivator drill Sept. and planted with same implement	Nabawa	Mid-April ...	34	80	Copper carbonate	Yes	
Thompson, M. A.	...	Salmon and gimlet	July	Disc	4	Good	Springtyne cultivated Aug. Nov. and prior to seeding. Planted with a combined cultivator drill	Nabawa	End April ...	38	118	Copper carbonate	Yes	Takeall
Collins, M. C.	...	Salmon and gimlet	June	Mould-board	4	Good	Disc harrowed Sept., prior to seeding. Planted with combined cultivator drill	Nabawa	End April ...	47	60	Copper carbonate	Yes	Takeall
Suiter, R. J.	1st	Salmon, gimlet, and mallee	July	Disc	3	Good	Harrowed in April. Planted with combined cultivator drill	Nabawa	Mid-April ...	22	50	Copper carbonate	Yes	

ZONE 5.

Judge—G. L. THROSSELL, Dipl. Agric., Agricultural Adviser.

Royal Society—1 competitor.

Merredin Society—13 competitors.

Bruce Rock Society—6 competitors.

Total—20 competitors.

MERREDIN AGRICULTURAL SOCIETY.

Thirteen crops were submitted for judging in this competition, although originally there were twenty-one entries. The awards made were as follow:—

MERREDIN AGRICULTURAL SOCIETY.

Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.

[illegible]	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Teasdale, H. W....	Totadgin ...	Nabawa ...	39	8	9	13	14	83
Cook, W.	S. Walgoolan	do. ...	38	9	8	13	14	82
Merredin Meat Co.	Merredin ...	Canberra ...	35	8	8	14	14	79
Maginan, J. D. ...	S. Walgoolan	Gluyas Late	35	8	8	12	14	77
Teasdale, Bros. ...	Belka ...	Nabawa ...	34	8	7	14	13	76
Thyne Bros. ...	Norpa ...	Merredin ...	31	8	8	14	13	74
Walder, L. S. ...	Merredin ...	Merredin ...	34	9	8	7	14	72
Rowan, C. H. ...	Totadgin ...	Nabawa ...	28	8	8	14	13	71
Maughan, T. G. & J.	Nukarni ...	do. ...	27	8	7	13	12	67
Smallacombe, T. H.	Nangeenan...	Canberra ...	24	8	8	14	13	67
Kay, J.	Baandee ...	Glyuas Early	26	7	7	13	13	66
Snell, C.	Nangeenan	Nabawa ...	27	8	6	12	12	65
Cockram, W. ...	Nukarni ...	Nabawa ...	21	8	8	13	13	63

The winner was Mr. H. W. Teasdale, of Totadgin, who entered a very fine crop of Nabawa, which was estimated to yield 39 bushels per acre, and which was awarded 83 points. The land, which originally carried gimlet, had been cleared since 1917, and was ploughed at the end of July with a mouldboard plough to a depth of 3½ inches, and cultivated with a rigid tyne scarifier in September, and after the heavy March rains. The crop was sown during the last week in April, 45 lbs. of graded seed and 120 lbs. of superphosphate per acre being applied. This crop was very tall and dense, and excepting for a few wild oats, was very free of weeds.

By winning this competition Mr. Teasdale wins outright the coveted "Teasdale Cup," which was presented by the Teasdale Bros. in 1922. The conditions attached to this cup were that it had to be won twice in succession or three times in all. Since 1922 no less than seven farmers have earned the honour of having

their names engraved on this cup, but Mr. H. W. Teasdale is the only winner who has held the cup on more than one occasion. The list of successful competitors is as follows:—

Teasdale Cup.—1922, R. Pollock; 1923, H. W. Teasdale; 1924, the late W. G. Woolgar; 1925, Teasdale Bros.; 1926, H. W. Teasdale; 1927, C. H. Rowan; 1928, T. H. Smallacombe; 1929, W. Cook; 1930, H. W. Teasdale.

The rainfall recorded at the various centres throughout the district is as hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Merredin	...	1	213	272	51	375	223	181	91	38	959	...	31	1,475
Nangeenan	...	1	315	218	38	325	177	229	81	44	894	4	85	1,517
Koonadgin	...	...	206	379	43	401	203	180	84	20	931	4	89	1,609
Belka	...	36	323	187	78	376	246	196	50	31	977	4	31	1,558
Nukarni	...	...	266	159	39	314	182	178	43	12	768	...	125	1,318
Baandee	...	...	165	220	58	295	155	197	54	12	771	...	22	1,178

A very noticeable feature of some of the competing crops was the prevalence to a very marked degree of the disease Take-all. This disease was responsible for a reduction in yield in the badly infected crops. As it was, however, the average yield of the thirteen competitors was 31 bushels per acre. This average could have been higher if the Take-all had been controlled by better farming methods in the past. As this disease is the consequence of indifferent methods, competitors should refer to page 85, where the question is discussed.

The cultural details are summarised below:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.					lb.	lb.			
Teasdale, H. W.	Unknown, cleared 1917	Gimlet	July–Aug.	Mould-board	3½	Good	Rigid tyne scarified Sept. and Mar. Planted with a combined cultivator drill	Nabawa	End April ...	43	120	Copper carbonate	Yes	Trace Takeall and Septoria
Cook, W. ...	5	Salmon, gimlet and mallee	June-July	Disc	3–4	Good	Rigid tyne scarified Aug. and Sept. Skim ploughed Mar. Planted with a combined cultivator drill	Nabawa	End April ...	43	100	Copper carbonate	Yes	Takeall
Merredin Meat Co.	...	Gimlet, salmon and mallee	May	Mould-board	4	Good	Rigid tyne scarified Aug., Sept., Nov., and April. Planted with combined cultivator drill	Canberra	1st week May...	54	180	Copper carbonate	Yes	Flag Smut, Takeall and Bunt
Maughan, J. D.	4	Gimlet	April	Combined cultivator drill	3	Good	Cross ploughed Aug.; springtyne cultivated Sept., Nov., and prior to seeding. Planted with combined cultivator drill	Gluyas Late	1st week May ...	45	100	Copper carbonate	Yes	Takeall and Flag Smut
Teasdale Bros.	Unknown, cleared 1914	Salmon and gimlet	June	Mould-board	3	Good	Springtyne cultivated Sept., Nov., and Mar. Disc ploughed prior to seeding Planted with combined cultivator drill	Nabawa	1st week May ...	45	94	...	Yes	Takeall
Thyne Bros.	...	Salmon and gimlet	June	Disc	4	Good	Reploughed with Disc Aug. Springtyne cultivated Sept., Oct., Mar. and Apl. Planted with combined cultivator drill	Merredin	Mid-May ...	45	75	Copper carbonate	Yes	Flag Smut
Walder, L. S.	...	Salmon, gimlet and morrel	July–Aug.	Disc	3	Good	Springtyne cultivated Oct.; rigid-tyne scarified prior to seeding. Planted with combined cultivator drill	Merredin	Last week April; first week May	35	60	Copper carbonate	Yes	Flag Smut

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed Treatment.	Graded.	Disease.
					in.					lb.	lb.			
Rowan, C. H.	...	Salmon and gimlet	Feb.	Rigid-tyne scarifier	2½	Dry	Ploughed with mouldboard June; harrowed July; rigid-tyne scarified end July; harrowed Nov.; springtyne cultivated in May. Planted with combined cultivator drill	Nabawa	Mid-May ...	40	112	Copper carbonate	Yes	Takeall, Trace Bunt
Maughan T. J & G.	6-7	Salmon and gimlet	July	Disc	4	Good	Cross ploughed early Aug.; springtyne cultivated Aug.-Sept. Planted with combined cultivator drill	Nabawa	1st week May ..	45	75	Copper carbonate	Yes	Takeall and Bunt
Smallacombe, T. H.	..	Mallee and jam scrub	July	Disc	4	Good	Springtyne cultivated in March. Planted with combined cultivator drill	Canberra	1st week May .	53	87	Copper carbonate	Yes	Flag Smut
Kay, J. ...	...	Salmon, gimlet, morrel and tea-tree	July	Mouldboard	3½	Good	Springtyne cultivated Sept., Nov., followed by harrowing; disc cultivated and rigid-tyne scarified prior seeding. Planted with combined cultivator drill	Gluyas Early	End May ...	45	90	Copper carbonate	Yes	Traces Takeall Flag Smut
Snell, C. ...	Unknown; cleared 1906	Salmon and gimlet	July	Disc	3-4	Good	Cultivated with combined cultivator drill Sept.; rolled in Feb. Planted with combined cultivator drill	Nabawa	1st week May ...	45	110	Copper carbonate	Yes	Takeall
Cockram, W.	Unknown; cleared 1918	Salmon and gimlet	July	Disc	4-5	Good	Disc cultivated Aug.; springtyne cultivated Sept.; disc cultivated April Planted with disc drill	Nabawa	2nd week May ...	45	80	Copper carbonate	Yes	Takeall

BRUCE ROCK AGRICULTURAL SOCIETY.

There were six competitors in the crop competition conducted by the Bruce Rock Agricultural Society, the awards being as follow:—

BRUCE ROCK AGRICULTURAL SOCIETY.

Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Smith, C. & Sons	Yarding ...	Gluclub ...	43	9	9	13	14	88
Ellis, E. G. ...	Central Kumminin	do. ...	39	9	8	12	14	82
Strange, P. A. ...	Yarding ...	do. ...	38	9	8	13	13	81
Smith, C. & A. H.	Yalbarrin ...	do. ...	38	9	7	13	14	81
Farrall, F. C. & Sons	Yarding ...	do. ...	35	9	8	12	13	77
Strachan, W. ...	Yarding ...	do. ...	36	8	7	12	13	76

Messrs. C. Smith & Sons, of Yarding, won the competition with an entry of the variety Gluclub, which was awarded 83 points, and which was estimated to yield 43 bushels per acre. This entry was portion of a paddock of 580 acres of the same variety. The land on which the crop was sown originally carried a forest of salmon gum and gimlet, which was cleared in 1910. It was ploughed with a disc implement in June and July to a depth of three inches, and was disc cultivated in August and September, cultivated with a combined cultivator-drill in April, and planted with the same implement. Seeding took place during the second week in May, the rates of seed and superphosphate being 46 lbs. and 93 lbs. per acre respectively. This crop was well grown, very free of weeds and disease, but lost points for admixture. In addition to gaining the Zone Championship, this crop was awarded the special prize for the highest bushel yield in the State.

The average yield of all competitors in this competition was 38 bushels per acre.

The rainfall recorded at the various centres in the district is shown in the table hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Bruce Rock ...	...	...	216	192	64	342	254	104	107	26	987	...	49	1,444
Yarding	...	9	209	134	72	380	252	194	124	31	1,053	...	15	1,420
Central Kumminin	...	9	137	162	79	367	303	136	133	29	1,047	9	35	1,399

The cultural details of competitors have been summarised in the following table:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment	Graded.	Disease.
					in.					lb.	lb.			
Smith, C., & Sons	Unknown, cleared 1910	Salmon and gimlet	June–July	Disc	3	Fair	Cultivated with disc Aug. and Sept., and cultivated with combine cultivator drill April, planted with same implement	Gluclub	2nd week May	46	93	Copper carbonate	Yes	Trace Flag Smut
Ellis, E. G. ...	Gimlet	Gimlet and jam	June	Disc	3 4	Good	Cultivated with disc in July; cultivated with a combined cultivator drill in Nov., and planted with same implement	Gluclub	Mid-May ...	50	90	Copper carbonate	Yes	Takeall and Flag Smut
Strange, P. A.	6	Salmon, gimlet, and morrel	June	Disc	3 4	Good	Cultivated with disc Sept. Springtyne cultivated Oct., March and May. Planted with combined cultivator drill	Gluclub	Mid-May ...	50	93	Copper carbonate	Yes	Takeall, Septoria and Flag Smut
Smith, C. & A. H.	...	Salmon and gimlet	June	Mouldboard	3	Good	Cultivated with disc Sept., Springtyne cultivated Oct. and April. Planted with combined cultivator drill	Gluclub	1st week May...	45	90	Copper carbonate	Recleaned	Ball Smut and Takeall
Parrall, F. C. & Sons	9	Salmon, gimlet, and morrel	June	Mouldboard	4	Good	Portion springtyne cultivated June, balance cultivated with disc end Aug. Rigid tyne scarified Sept., Springtyne cultivated Sept., Nov., March. Planted with combined cultivator drill	Gluclub	Last week April	48	108	Copper carbonate	Yes	Takeall
Strachan, W.	2	Salmon and gimlet	July–Aug.	Disc	3½	Fairly good	Cultivated with disc and Sept., cultivated with springtyne cultivator Sept. and end Nov. Planted with combined cultivator drill	Gluclub	Mid-April ...	60	90	Copper carbonate	...	Takeall, Septoria and Flag Smut

ROYAL AGRICULTURAL SOCIETY—ZONE 5.

The competitors in this competition include the first and second prize winners in the Merredin and Bruce Rock District Agricultural Societies' Crop Competitions, together with an entry received direct by the Royal Agricultural Society.

The awards were as follow:—

ROYAL AGRICULTURAL SOCIETY—ZONE 5.

Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.

Competitor	District.	Society.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Smith, C. & Sons	Yarding ...	Bruce Rock	Gluclub ...	43	9	9	13	14	88
Teasdale, H. W.	Totadgin ...	Merredin ...	Nabawa ...	39	8	9	13	14	83
Ellis, E. G. ...	Central Kumminin	Bruce Rock	Gluclub ...	39	9	8	12	14	82
Cook, W. ...	South Walgoolan	Merredin ...	Nabawa	38	9	9	13	14	83
Hammond, J. D.	Kellerberrin	Royal ...	Nabawa	25	8	7	13	12	65

The crop of Messrs C. Smith & Sons, of Yarding, in addition to winning the Zone Championship, won the special prize of £5 5s. awarded annually by the Royal Agricultural Society for the highest bushel yield in the State. A yield of 43 bushels per acre is certainly a fine achievement, and is only three bushels less than the official State record of Mr. C. E. Cockram, of Pallinup, whose crop of Yandilla King in 1929 yielded 46 bushels per acre.

The rainfall for the districts where the competitors are located was as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total for year.
Yarding	9	209	134	72	380	252	194	124	31	1,053	...	15	1,420
Merredin	13	526	201	68	283	247	256	91	36	1,081	...	81	1,902
Kellerberrin	...	206	379	43	401	203	180	84	20	931	4	89	1,609
Central Kumminin	9	137	162	79	367	303	136	133	29	1,047	9	35	1,390
Kellerberrin	5	184	227	52	376	289	222	109	26	1,024	5	...	1,425

The cultural details are as follow:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed Treatment.	Graded.	Disease.
					in.									
Smith, C. & Sons	Unknown; Cleared 1910	Salmon and gimlet	June–July	Disc	3	Fair	Disc cultivated Aug. and Sept.; cultivated with combined drill cultivator April and planted with same implement	Gluclub	2nd week May...	46	93	Copper carbonate	Yes	Trace Smut Flag
Teasdale, H. W.	Unknown; cleared 1917	Gimlet ...	July Aug.	Mould-board	3½	Good	Rigid tyne scarified Sept. and March; planted with combined cultivator drill	Nabawa	End April ...	43	120	Copper carbonate	Yes	Trace Takeall and Septoria
Ellis, E. G. ...	...	Gimlet and jam	June	Disc	3–4	Good	Disc cultivated July; cultivated with combined cultivator drill Nov. and planted with same implement	Gluclub	Mid-May ...	50	90	Copper carbonate	Yes	Takeall Flag Smut
Cook, W. ...	5	Salmon, gimlet, morrel and mallee	June–July	Disc	3–4	Good	Rigid tyne scarified Aug. and Sept., skim ploughed March; planted with combined cultivator drill	Nabawa	End April ...	43	100	Copper carbonate	Yes	Takeall.
Hammond, J. D.	2	Gimlet ...	July–Aug.	Mould-board	4	...	Disced once, springtyne cultivated several times	Nabawa	Mid-May ...	60	112	Copper carbonate	Yes	Takeall

ZONE 7.

Judge—J. H. Langfield, Manager, Merredin Experiment Farm.

Royal Society—no competitors.

Karlgarin Society—5 competitors.

Lake Grace Society—10 competitors.

Kulin Society—15 competitors.

Total—30 competitors.

KARLGARIN AGRICULTURAL SOCIETY.

In the Karlgarin Agricultural Society's competition there were twelve entries, but seven withdrew before inspection. The awards were as follow:—

KARLGARIN AGRICULTURAL SOCIETY.

Judge: J. H. Langfield Manager Experimental Farm, Merredin

Competitor.	District.		Yield.	Freedom from Weeds.	Freedom from Disease	Freedom from Admixture.	Evenness of Growth.	Total 100 points
			50 points	10 points	10 points	15 points	15 points	
Biglin, E. J. ...	Karlgarin ...	Gluyas Early	32	8	8	12	13	73
Treasure, C. ...	do. ...	Turvey ...	28	8	9	11	13	69
Metcalf, G. ...	do. ...	Gluyas Early	25	9	9	12	13	68
Howlett, A. ...	do. ...	Nabawa ...	26	9	7	13	13	68
Shawyer, C ...	do. ...	Nabawa ...	24	9	8	13	13	67

Mr. E. J. Biglin was placed first with a crop of Gluyas Early, which was estimated to yield 32 bushels per acre. Mr. C. Treasure was placed second with a crop of Turvey, with an estimated yield of 28 bushels per acre.

A fair amount of admixture was present in most of the crops in this competition, but as the district has been 25 to 30 miles from a railway, the difficulty in getting pedigree seed is quite apparent. Now that a railway is being constructed through the district, farmers should secure a few bags of pedigree seed.

The rainfall for East Karlgarin during the year is shown in the following table:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
East Karlgarin ...	...	3	342	172	112	302	374	206	87	29	1,070	30	64	1,681

The cultural details are as follow:—

CULTURAL DETAILS.

Competitor.	Timber.	When ploughed.	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed Treatment	Grubbed.
				ins.				lbs.	lbs.		
Biglin, E. J. ...	Salmon and gimlet	July	Rigid tyne scarifier	2½–3	Springtyne cultivated and harrowed Sept., Nov., and Mar. Sown with combined cultivator drill	Gluyas Early	Early May ...	45	60	Copper carbonate	Yes
Treasure, C. ...	Morrel, mallee and gimlet	End June	Disc, cultivator	3	Worked back with same implement Sept. Harrowed Nov. and sown with combined cultivator drill	Turvey ...	Late April ...	45	93	Copper carbonate	Yes
Metcalf, G. ...	Salmon, mallee and morrel	August	Disc.	3½–4	Springtyne cultivated Sept., and harrowed. Harrowed again before seeding. Sown with disc drill	Gluyas Early	Mid May ...	58	70	Copper carbonate	Yes
Howlett, A. ...	Gimlet, salmon and morrel	July and August	Disc, cultivator	3	Springtyne cultivated Sept. and twice harrowed. Disc cultivated last week May. Sown with disc drill	Nabawa ...	Early June ...	40	47	Copper carbonate	No
Shawyer, C. ...	Salmon, gimlet and morrel	October	Disc, cultivator	4	Springtyne cultivated Nov. Sown with disc drill and springtyne cultivated after drilling	Nabawa ...	Early May ...	45	60	Copper carbonate	Yes

LAKE GRACE AGRICULTURAL SOCIETY.

In this competition there were originally twelve entries, but two competitors withdrew before inspection.

The awards were as follow:—

LAKE GRACE AGRICULTURAL SOCIETY.

Judge: J. H. Langfield, Manager, Experimental Farm, Merredin.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Coad, H. J. ...	Lake Grace	Nabawa ...	35	9	9	14	14	81
Colinson & Fleay	do. ...	Gluyas Late	33	9	9	14	13	78
Bishop, H. F.	do. ...	Nabawa ...	31	9	9	14	14	77
Woodburn, J. ...	do. ...	Yandilla King	31	9	9	14	14	77
Fry, E. H. ...	do. ...	Gluyas Early	31	9	9	13	14	76
Burns, E. E. ...	do. ...	Yandilla King	29	8	8	14	13	72
Griffiths & Green...	do. ...	Caliph ...	27	9	9	13	13	71
Griffin, C. ...	Neendalling	Bena ...	24	8	8	14	12	67
Hadden, C. F. ...	Burngup ...	Nabawa ...	25	8	8	14	12	67
Witham & Sons ...	Lake Biddy	Gluyas Early	20	7	8	14	12	61

The winning entry was shown by H. J. Coad, the variety being Nabawa, and the estimated yield 35 bushels per acre. It was thick, even, free from weeds, disease, or admixture, and would be a creditable exhibit in any competition.

Messrs. Collinson and Fleay were placed second with a very fine crop of Gluyas Late, estimated at 33 bushels per acre and, like the winning crop, had very few faults.

Messrs. H. F. Bishop, J. Woodburn, and E. H. Fry all exhibited splendid crops, and although only 50 acres were inspected, they all had a much larger area that would yield equally as well.

The average yield over the ten crops inspected in this competition was 28.6 bushels per acre.

Below is given the rainfall for 1930:—

	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total for year.
Lake Grace ...	...	17	70	180	133	382	504	102	95	44	1,260	3	54	1,584
Kake Biddy ...	...	25	317	227	124	305	291	155	86	43	1,004	...	...	1,573

The cultural details are as follow:—

CULTURAL DETAILS.

Competitor.	Timber.	When ploughed.	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seeds.	Rate of super.	Seed Treatment.	Graded.
				ins.				lb.	lb.		
Coad, H. J. ...	Gimlet, blackbutt and yorrel	July	Disc cultivator	3½	Springtyne cultivated three times in Spring and once before seeding. Sown with combined cultivator drill	Nabawa ...	End April ..	45	150	Copper carbonate	Yes
Collinson & Fleay ...	Salmon and gimlet	August	Disc cultivator	3½	Springtyne cultivated before seeding. Sown with disc drill and harrowed	Gluyas Late ...	Early May ...	45	80	Copper carbonate	No
Bishop, H. F. ...	Gimlet	Late June	Disc cultivator	3	Springtyne cultivated Sept. Planted with combined cultivator drill	Nabawa ..	End April ...	45	120	Copper carbonate	Yes
Woodburn, J. ...	Morrel and blackbutt	Late July	Disc cultivator	3½	Springtyne cultivated Aug. and Nov., and before seeding. Sown with disc drill	Yandilla King	Mid April ...	50	120	Copper carbonate	No
Fry, E. H.	Salmon and morrel	End June	Disc cultivator	3½	Disc cultivated Aug. Harrowed three times before end Dec. Sown with combined cultivator drill	Gluyas Early	Mid May ..	60	135	Copper carbonate	Yes
Burns, E. E. ...	Morrel and salmon	Early July	Disc cultivator	3–4	Springtyne cultivated Sept. and Nov. Sown with combined cultivator drill	Yandilla King	Mid April ...	50	125	Copper carbonate	Yes
Griffiths & Green ...	Gimlet, morrel and yorrel	August	Disc cultivator	3	Springtyne cultivated Sept Disc cultivated before seeding. Sown with disc drill	Caliph ...	Early June ...	50	80	Formalin	Winnowed
Griffin, C.	Salmon and manna gum	June and July	Disc cultivator	3–4	Springtyne cultivated Sept. Disc cultivated before seeding. Sown with combined plough-drill	Bena	End April .	50	120	Formalin	No
Hadden, C. F. ...	Salmon and morrel	August	Disc	3	Ploughed back in Spring. Harrowed before seeding. Sown with disc drill	Nabawa .	End April ..	45	100	Copper carbonate	Yes
Witham & Sons ..	Salmon and morrel	End July	Disc cultivator	3	Ploughed back in Oct. Some sown with drill and some with combined plough drill	Gluyas Early	June .	50	60	Copper carbonate	No

KULIN AGRICULTURAL SOCIETY.

The competition conducted by this Society was well contested, the winning entry being calculated to yield 37 bushels, while the lowest yield was better than eight bags. The awards were as follow:—

KULIN AGRICULTURAL SOCIETY.

Judge. J. H Langfield, Manager, Experiment Farm, Merredin.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Henderson, J. H....	Gnarming ...	Queen Fan	37	6	9	14	14	83
Bowey & Baldock	Kulin ...	Ford ...	33	9	9	13	14	78
Bowey, P. J. ...	do. ...	do. ...	32	9	9	13	14	77
Lewis, R. H. ...	do. ...	do. ...	31	9	9	13	14	76
Nichols, R. ...	do. ...	Gluyas Early	30	9	8	14	13	74
Parker, C. W. ...	do. ...	Merredin ...	30	9	8	14	12	73
Trotter, A. W. ...	Kulin Rock	Bena ...	30	7	9	13	13	72
Bailey & Russell ...	Kulin ...	Merredin ...	29	6	9	13	13	72
Freebairn, F. S.	do. ...	Queen Fan...	28	9	9	13	13	72
Biggin, H. ...	Kondinin ...	Nabawa ...	26	8	8	14	14	70
Bowey, Mrs. ...	Kulin ...	Queen Fan	25	9	9	13	13	69
Clarke, A. H. & J. H.	do. ...	do. ...	27	8	8	13	13	69
Hodgson, J. H. ...	do. ...	Gluyas Late	28	8	7	13	12	68
Scadding, M. ...	do. ...	Queen Fan...	25	8	9	13	13	68
Meikle, P. ...	do. ...	Gluyas Late	27	8	8	13	12	68

Mr. H. J. Henderson was awarded first place in the Kulin competition with a crop of Queen Fan. This also secured first place in Zone 7. It was calculated to yield 37 bushels per acre. It was a well stooled, even crop, very free from disease and admixture. Mr. Henderson had similar success with the same variety last year, when the yield was calculated at 28 bushels compared with 37 bushels this year.

Second place went to Messrs. Bowey and Baldock with a crop of Ford. This was also a very fine crop and gave a calculated yield of 33 bushels per acre. Third and fourth places were secured by Mr. P. J. Bowey and R. H. Lewis respectively, both with Ford, the yields of which were estimated at 32 and 31 bushels per acre.

For the fifteen crops entered in this Society's competition the average calculated yield was 29.2 bushels per acre.

Flag Smut and Take-all was noticed in many crops, Gluyas Early being the most affected with Flag Smut, whilst to a lesser degree it was found in Merredin, Queen Fan and Gluyas Late. Take-all was showing in many crops, but in most cases would not greatly reduce the yield.

Mr. Parker's crop at Merredin was down very badly. This could be attributed mainly to planting too early; it had been sown the latter end of April and had made a wonderful growth of foliage. Had it been sown a fortnight to three weeks later the yield of grain would have been equally as good, whilst the growth of straw would have been restricted and the liability to lodge greatly reduced.

The rainfall during the year was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total. for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Kulin	...	6	212	210	89	400	455	174	71	36	1,225	8	73	1,734
Kondinin	...	...	126	181	68	312	364	155	144	32	1,075	7	50	1,439

The cultural details are summarised in the table below:—

CULTURAL DETAILS.

Competitor.	Timber.	When ploughed.	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.
				ins.				lb.	lb.		
Henderson, J. H.	Yorkgum, morrel and salmon	Early July	Rigid-tyne scarifier.	3	Harrowed Aug. Springtyne cultivated Sept. and Mar. Sown with combined cultivator drill, and harrowed after	Queen Fan	Mid May	45	112	Copper carbonate	Yes
Bowey & Baldock	Salmon	Mid July	do.	3	Springtyne cultivated Oct. and Mar. Sown with combined cultivator drill	Ford	End of April	50	100	Copper carbonate	Yes
Bowey, P. J. ...	Salmon and morrel	August	do.	2–3	Springtyne cultivated Oct. Rigid tyne scarifier Mar. Sown with combined cultivator drill	Ford	End of April	50	100	Copper carbonate	Yes
Lewis, R. H. ...	Jam, salmon and mallee	June	do.	2	Crossed with rigid-tyne scarifier Aug. Springtyne cultivated March. Harrowed. Sown with combined cultivator drill and again harrowed	Ford	End of April	60	112	Copper carbonate	Yes
Nichols, R. ...	Salmon, yorkgum and jam	July	Disc	3	Turned back Aug. Springtyne cultivated Sept. Sown with combined cultivator drill	Gluyas Early	2nd week May	60	85	Copper carbonate	Yes
Parker, C. W. ...	Salmon, morrel, and blackbutt	August	Disc	3	Disc cultivated Nov. Sown with combined cultivator drill	Merredin	End of April	45	90	Copper carbonate	Yes
Trotter, A. W. ...	Jam and forest	July	Disc	3	Turned back Oct. Sown with combined cultivator drill	Bena	Mid April	45	128	Copper carbonate	Yes
Bailey & Russell	Salmon, gimlet, and morrel	July	Disc cultivated	3½–4	Ploughed back Sept. Harrowed Nov. Sown with combined cultivator drill	Merredin	Mid May	45	95	Copper carbonate	Yes
Freebairn, F. S. ...	Salmon, yorkgum, jam	August	Disc	4	Harrowed Sept. Springtyne cultivated. Oct. Harrowed Oct. Springtyne cultivated Mar. Sown with combined cultivator drill	Queen Fan	Mid April	60	90	Copper carbonate	Yes
Biggin, H. ...	Salmon and gimlet	July	Disc cultivator and mouldboard	3 4	Disc cultivated Aug. Springtyne cultivated Mar. Sown with combined cultivator drill	Nabawa	Early May	48	100	Copper carbonate	Re-winnowed
Bowey, Mrs. ...	Salmongum	August	Rigid-tyne scarifier	2½	Harrowed Oct. Springtyne cultivated Mar. Sown with combined cultivator drill	Queen Fan	Mid April	50	90	Copper carbonate	Yes

CULTURAL DETAILS *continued.*

Competitor.	Timber	When ploughed.	Implement.	Depth	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.
				Ins.				lb.	lb.		
Hodgson, J. R.	Gimlet, salmon, and morrel	Summer fallow Mar., 1929	Disc cultivator	3	Disc cultivated July. Rigid-tyne scarified Sept. Springtyne cultivated Nov. and April. Sown combined cultivator drill	Late Gluyas	Mid May	55	90	Copper carbonate	Yes
Scadding, M.	Gimlet, morrel, Tea-tree	July	Disc cultivator	3	Springtyne cultivated Mar. Sown combined cultivator drill	Queen Fan	Mid April	60	70	Copper carbonate	Yes
Clarke, A. H. & J. H.	Morrel, merritt, mallee	August	Disc	3	Rigid-tyne scarified Sept. Springtyne cultivated Mar. Sown with combined cultivator drill	Queen Fan	End of April	56	100	Copper carbonate	Yes
Meikle, P.	Salmon gimlet	July	Mouldboard	4	Cross ploughed with disc cultivator plough Sept. Springtyne cultivated and harrowed Oct. Sown with combined cultivator drill	Late Gluyas	Early May	38	90	Copper carbonate	Yes

ROYAL AGRICULTURAL SOCIETY—ZONE 7.

There were no individual competitors in this zone who entered direct with the Royal Agricultural Society, so that the competition was confined to the first and second prize winners of the Kulin, Karlgarin and Lake Grace Societies, the awards being as shown in the accompanying table:—

ROYAL AGRICULTURAL SOCIETY—ZONE 7.

Judge: J. H. Langfield, Manager, Experiment Farm, Merredin.

Competitor.	District.	Agricultural Society.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Henderson, J. H.	Gnarming	Kulin ...	Queen Fan	37	9	9	14	14	83
Coad, H. J. ...	Lake Grace	Lake Grace	Nabawa ...	35	9	9	14	14	81
Bowey & Baldock	Kulin ...	Kulin ...	Ford ...	33	9	9	13	14	78
Collinson & Fleay	Lake Grace	Lake Grace	Gluyas Late	33	9	9	14	13	78
Biglin, E. J....	Karlgarin	Karlgarin...	Gluyas Early	32	8	8	12	13	73
Treasure, C. ...	Karlgarin	Karlgarin...	Turvey ...	28	8	9	11	13	69

The honour of winning the Zone Championship was won by Mr. J. H. Henderson of Gnarming, who gained the highest number of points with his entry of Queen Fan.

The cultural details of these prize winners have been grouped in the following table for comparison:—

CULTURAL DETAILS.

Competitor.	Timber.	When ploughed	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed Treatment.	Graded.
				ins				lb.	lb		
Henderson, J. H ...	Yorkgum, morrel and salmon	Early July	Rigid-tyne scarifier	3	Harrowed August, Springtyne cultivated Sept. and Mar. Sown with combined cultivator drill and harrowed	Queen Fan ...	Mid May ...	45	112	Copper carbonate	Yes
Road, H. J. ...	Gimlet, blackbutt and morrel	July	Disc. cultivator	3½	Springtyne cultivated three times in Spring and once before seeding. Sown with combined cultivator drill	Nabawa ...	End April ...	45	150	Copper carbonate	Yes
Bowey & Baldock ...	Salmon	Mid July	Rigid-tyne scarifier	3	Springtyne cultivated Oct. and Mar. Planted with combined drill cultivator	Ford	End April ...	50	100	Copper carbonate	Yes
Collinson & Fleay ...	Salmon and gimlet	August	Disc. cultivator	3½	Springtyne cultivated before seeding. Planted with disc drill and harrowed	Gluyas Late ...	Early May ...	45	80	Copper carbonate	No
Biglin, E. J. ...	Gimlet and salmon	July	Rigid-tyne scarifier	2½–3	Springtyne cultivated and harrowed Sept., Nov., and Mar. Sown with combined cultivator drill	Gluyas Early ...	Early May ...	45	60	Copper carbonate	Yes
Treasure, C. ...	Morrel, mallee and gimlet	End June	Disc. cultivator	3	Worked back with same implement Sept. Harrowed Nov., Sown with combined cultivator drill	Turvey ...	Late April ...	58	70	Copper carbonate	Yes

ZONE 8.

Judge: A. S. WILD, B.Sc. (Agric.), Agricultural Adviser.

Royal Society—2 competitors.

Gnowangerup Society—14 competitors.

Nyabing Society—5 competitors.

Total—21 competitors.

GNOWANGERUP AGRICULTURAL SOCIETY.

Of the twenty-nine entries received for the competition conducted by this Society, fourteen crops were submitted for inspection.

The awards were made as follow:—

GNOWANGERUP AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
White, R. H.	Pallinup ...	Yandilla King	38	9	9	14	13	83
Barnard, C. E.	Pallinup ...	Yandilla King	37	8	9	14	12	80
McDonald, J.	Gnowangerup...	Nabawa ...	35	9	9	14	12	79
Stewart, W. B.	Gnowangerup...	Yandilla King	34	9	9	13	13	78
Formby, R. & Co., Ltd.	Gnowangerup...	Yandilla King	32	9	9	13	13	76
Whyatt, C. A.	Pallinup ...	Yandilla King	30	9	9	14	13	75
Johnston, A.	Gnowangerup...	Nabawa ...	30	9	9	14	12	74
Taylor, C. ...	Pallinup ...	Yandilla King	31	8	9	14	12	74
Cockram, C. E.	Pallinup ...	Yandilla King	29	9	9	13	13	73
Murray, W. G.	Borden ...	Yandilla King	30	9	8	13	13	73
Lahoar, W. ...	Gnowangerup...	Bena	25	9	9	13	13	69
Moir, J. A. ...	Borden ...	Yandilla King	25	9	8	13	13	68
Pozzi, R. ...	Gnowangerup...	Drof	28	7	8	13	12	68
Wellard & Wellard	Gnowangerup...	Nabawa ...	26	8	9	13	12	68

Mr. R. H. White's crop of Yandilla King, calculated to yield 38 bushels per acre, was awarded first place in both the district and the No. 8 Zone Competitions.

This was a dense, well-headed crop, comparatively free of weeds, disease or admixture. The seed had been planted at the rate of 45 lbs. per acre and the superphosphate applied at the rate of 90 lbs. per acre during the third week in May. The land had been prepared by ploughing to a depth of 4 inches during July of the previous year. This was followed by a springtyne cultivation in October and another early in May. The seed was planted by means of a combined cultivator drill to which light drag harrows were attached.

The performance of the Gnowangerup district over the five years in which the Society has conducted crop competitions is undoubtedly meritorious. The average calculated yield (over 50-acre plots) of the 51 competitors since 1926 is 32.8 bushels. The lowest average of 30.7 bushels per acre was obtained by the fourteen competitors in 1930, and the highest of 35.4 bushels by the sixteen competitors in 1929.

Possibly these high figures are partially indicative of a cycle of good years, but they indeed show that good farming, fertile land, and favourable climatic conditions are not to be dissociated from the district.

The keen spirit of the competitors in the Gnowangerup district, and the competitions themselves, have played no small part in the advancement of yields. The attainment of good yields has become, not the aim of the few, but the realisation of the majority.

Skilful handling of fallow, so necessary in a district liable to the climatic conditions of 1930, is made easier by the comparatively small areas under wheat culture on each farm.

The time of seeding in this district is a matter of increasing importance. The tendency for late seeding is one which may over-step the limits of prudence, particularly when the tractive power of the farm is limited to one team of horses. Although we must admit the lateness of the district, it is perhaps sound advice that farmers should endeavour to complete their seeding operations by the middle of June.

The high yields obtained in the 1930 competition are not so indicative of the general high averages throughout the district as were those of the previous year. In several instances it was noted that the 50-acre areas, although not planted specifically as competition plots, were seeded at opportune times in a season which was decidedly erratic.

The rainfalls as recorded at Borden and Gnowangerup are given below:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Borden	...	3	266	109	290	240	291	35	103	25	984	15	133	1,510
Gnowangerup ...	...	15	148	86	359	363	298	50	137	18	1,225	6	67	1,547

The cultural details of the competing crops are tabulated hereunder:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent cultivation.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.				lb.	lb.			
White, R. H.	Old land	Yorkgum...	July	Good	Mould-board	4	Springtyne cultivated. Oct. and early May. Plot sown with combined cultivator drill followed by light harrows	Yandilla King	Mid-May ...	45	90	Copper Carbonate	Yes	
Barnard, C. E.	7	Yorkgum, whitegum and morrel	Aug.	Hard	Mould-board	3½	Springtyne cultivated Sept. or early Oct. Plot sown with combined cultivator drill	Yandilla King	3rd week May	45	85	No	Yes	
McDonald, J.	Old land	Salmon, morrel and yorkgum	July and Aug.	Good	Mould-board	4	Harrowed end Aug., springtyne cultivated Oct. and Nov. Harrowed Feb., springtyne cultivated March and portion at end of May. Moulded about July, planted with combined cultivator drill	Nabawa	1st week Aug.	55	140	Copper Carbonate	Yes	Trace of Rust
Stewart, W. B.	3	Morrel and yorkgum	Early July	Good	Mould-board	3	Springtyne cultivated Sept., Nov., and early April. Planted with combined cultivator drill	Yandilla King	3rd week June	50	175	Copper Carbonate	Yes	Trace of Rust
Formby, R. & Co., Ltd.	1	Salmon and morrel	Late July	Good	Mould-board	3½	Springtyne cultivated Sept. Disc cultivated 2in. deep Nov. Rigid tyne cultivated early April. Planted with combined cultivator drill	Yandilla King	3rd week May	53	130	Copper Carbonate	Yes	Traces of Flying Smut
Wyatt, C. A.	5	Yorkgum and yate	Aug.	Fair	Mould-board	4	Harrowed Sept. Springtyne cultivated Sept., Oct., Mar., and May	Yandilla King	3rd week May	45	80	Copper Carbonate	Yes	

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	when ploughed	Condition of land.	Implement.	Depth.	Subsequent cultivation.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Johnston, A.	3	Sheoak, mannagum and yorkgum	Aug.	Good	Mould-board	in. 3	Rigid tyne cultivated twice before harvesting and once before seeding	Nabawa	Mid-June ...	60	90	Copper Carbonate	Yes	
Taylor, C. ...	Old land	Yorkgum and jam	June	Good	Mould-board	3½	Springtyne cultivated Sept. and Oct. Planted with combined cultivator-drill	Yandilla King	3rd week May	62	93	Copper Carbonate	Yes	
Cockram, C. E.	Old land	Yorkgum chiefly	Nov.	Patchy	Mould-board	4	Springtyne cultivated Nov., Jan., April, and May. Planted with combined cultivator-drill	Yandilla King	Mid-June ...	55	150	Copper Carbonate	Yes	Trace of Rust
Murray, W. G.	1	Yorkgum and jam	July	Hard	Disc	2 to 3	Springtyne cultivated Sept. Nov. and Mar. Planted with combined cultivator-drill	Yandilla King	Mid-May ...	52	100	Copper Carbonate	Yes	Trace of Rust and Flying Smut.
Lahoar, W. ...	Old land	Salmon and yorkgum	Aug.	Dry	Mould-board	4	Springtyne cultivated twice in Spring, 3 times Autumn and again before seeding. Planted with combined cultivator-drill	Bena	3rd week May	60	150	Copper Carbonate	Yes	Trace of Rust.
Moir, J. A. ...	1	Jam and sheoak	July and Aug.	Good	Disc.	4 to 5	Disc. cultivated 4in. deep Sept. Springtyne cultivated April. Planted with combined cultivator-drill	Yandilla King	2nd and 3rd week May	60	125	Copper Carbonate	Yes	Rust.
Pozzi, R. ...	Old land	Chiefly salmon and jam	Nov.	Fairly Hard	Mould-board	3	Springtyne cultivated twice before seeding. Planted with combined cultivator-drill	Drof	End May ...	58	90	Copper Carbonate	Yes	Traces of Rust and Ball Smut.
Wellard & Wellard	1	Salmon and jam	Nov.	Patchy	Mould-board	3½	Disc. cultivated 2½in. deep, end Nov. Springtyne cultivated Mar. Planted with combined cultivator-drill	Nabawa	End May ...	60	90	Copper Carbonate	Yes	Trace of Flying Smut.

NYABING AGRICULTURAL SOCIETY.

Five crops were inspected in the competition organised by the Nyabing Agricultural Society, the awards being as follow:—

NYABING AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Slee, E. J. W.	Boongadoo ...	Major	36	7	8	12	13	76
Sargent, A. McD.	Boongadoo ...	Major	32	8	7	12	13	72
Tranter, C. O.	Pingrup ...	Nabawa ...	28	8	8	13	13	70
Stockden, P. ...	Pingrup ...	Yandilla King	26	9	8	12	12	67
Altham, G. ...	Pingrup ...	Gluyas Early ...	19	9	8	14	13	63

Both Messrs. Slee and Sargent had high yielding crops both of the variety Major. The winning crop had been planted early in May at the rate of 45 lbs. of graded seed per acre and 120 lbs. of superphosphate per acre. The land had been well prepared by ploughing 3½ inches deep with a mouldboard plough during July and August. It was springtyne cultivated in September and again in October, disc-cultivated 2 inches deep in March and planted with a combined cultivator drill.

The rainfall recorded at Pingrup during the year is shown hereunder:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Pingrup	...	13	297	103	186	367	308	81	128	36	1,106	6	53	1,578

The cultural details of the competitors are summarised below:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.				lb.	lb.			
Slee, E. J. W.	Old land	Morrel and yorkgum	July and Aug.	Good	Mould-board	3½	Springtyne cultivated Sept. and Oct. Disc. cultivated 2in. deep March. Planted with combined cultivator-drill	Major	Early May ...	45	120	Formalin	Yes	Trace ing and Smut. Fly Smut Flag
Sargent, A. McD.	7	Morrel, salmon, mallee, whitegum, and jam	July and Aug.	Good	Mould-board	3½	Disc. cultivated 2in. deep Sept. Planted with combined plough drill	Major	1st and 2nd week May	45	100	Copper Carbonate	Yes	Trace Smut, and Smut. Ball Flag, Flying
Trainer, C. O.	3	Blackbutt and boree	July	Good	Disc.	3½	Springtyne cultivated Sept. Harrowed Nov. Planted with combined cultivator drill	Nabawa	End April ...	35	75	Copper Carbonate	Yes	Trace and Smut Ball Flying
Stoekden, P.	4	Blackbutt, boree and salmon gum	June	Dry	Disc.	4	Springtyne cultivated Aug. Sept., Jan. and April	Yandilla King	2nd week April	45	45	Copper Carbonate and Formalin	Yes	Trace Smut Rust. Ball and
Altham, E. ...	3	Morrel, gimlet and salmon	Aug.	Good	Disc.	4	Disc. cultivated 2in. deep Oct., and before seeding	Ghyas Early	1st week June	60	90	Copper Carbonate	Yes	Trace Take- all.

ROYAL AGRICULTURAL SOCIETY—ZONE 8.

For the Royal Agricultural Society's competition in this zone two entries were received direct by the Royal Agricultural Society, and the other competitors were the first and second prize winners of the Nyabing and Gnowangerup crop competitions.

The awards were as follow:—

ROYAL AGRICULTURAL SOCIETY—ZONE 8.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	Society.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
White, R. H.	Gnowangerup...	Yandilla King	38	9	9	14	13	83
Barnard, C. E.	Gnowangerup...	Yandilla King	37	8	9	14	12	80
Richards, T.	Royal	Nabawa ...	33	8	9	14	13	77
Slee, E. J. W.	Nyabing ...	Major	36	7	8	12	13	76
Bryant, R. J.	Royal	Gluyas Early	27	9	8	14	14	72
Sargent, A. McD.	Nyabing ...	Major	32	8	7	12	13	72

The winner was Mr. R. H. White, of Palinup, whose crop of Yandilla King was awarded 83 points. It will be seen that the high standard was maintained this year, the lowest yield being 27 bushels per acre.

The monthly rainfall for the year was as hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Gnowangerup		15	148	86	359	363	298	50	137	18	1,225	6	67	1,547
Nyabing		33	69	129	315	443	423	107	127	52	1,467	10	22	1,730
Quairading		21	86	131	43	413	439	181	87	38	1,201	9	18	1,466

The cultural details are summarised in the accompanying table:—

CULTURAL DETAILS.

Competitor.	No. Years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed Treatment.	Graded.	Disease.
						in.				lb	lb			
White, R. H.	Old land	Yorkgum	July	Good	Mould-board	4	Springtyne cultivated Oct. and early May. Planted with combined cultivator-drill, followed by light harrows	Yandilla King	Mid-May ...	45	90	Copper Carbonate	Yes	
Barnard, C. E.	7	Yorkgum, whitegum, and morrel	Aug.	Hard	Mould-board	3½	Springtyne cultivated Sept. or early Oct. Planted with combined cultivator-drill	Yandilla King	3rd week May	45	85	No	Yes	
Richards, T.	Old land	Salmon gimlet and morrel	July	Good	Mould-board	4	Springtyne cultivated Sept., Oct., and prior seeding. Planted with combined cultivator-drill	Nabawa	End May ...	48	168	Copper Carbonate	Yes	
Slee, E. J. W.	Old land	Morrel and yorkgum	July–Aug.	Good	Mould-board	3½	Springtyne cultivated Sept. and Oct. Disc. cultivated 2in. deep March. Planted with combined cultivator-drill	Major	Early May ...	45	120	Formalin	Yes	Traces of Fly-ing and Flag Smut
Bryant, R. J.	Old land	Salmon and gimlet	July	Good	Disc	4	Springtyne cultivated and harrowed Sept. Planted with combined cultivator-drill	Ghyyas Early	2nd and 3rd week May	75	95	Copper Carbonate	Yes	Traces Flag Smut.
Sargent, A. McD	7	Morrel, salmon, mallee, whitegum, and jam	July–Aug.	Good	Mould-board	3½	Disc cultivated 2in. deep Sept. Planted with combined plough-drill	Major	1st and 2nd week May	45	100	Copper Carbonate	Yes	Traces of Bail, Flag and Flying Smut

ZONE 9.

Judge: L. G. SEINOR, Manager, Experiment Farm, Salmon Gums.

Southern Mallee Society—23 competitors.

SOUTHERN MALLEE AGRICULTURAL SOCIETY.

There were twenty-three entries in this competition, an increase of twelve upon the previous year. This is an indication that the farmers in the Esperance wheat area are alive to the value of competitions of this nature. The awards made were as follow:—

SOUTHERN MALLEE AGRICULTURAL SOCIETY.

Judge: L. G. Seinor, Manager, Experiment Farm, Salmon Gums.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Waters, T. ...	Dowak ...	Gluyas Early	26	9	9	10	14	68
O'Kieffe, M. ...	Dowak ...	Gluyas Early	23	9	9	12	14	67
Sharpe, H. S. ...	Treslove ...	Nabawa ...	22	9	9	13	13	66
Smale Bros. ...	Kumarl ...	Gluyas Early	20	9	9	14	13	65
Sasella, J. ...	Circle Valley	Gluyas Early	22	9	9	14	11	65
Shaw, J.	Salmon Gums	Nabawa ...	22	8	9	14	12	65
Steele, S. C. ...	Treslove ...	Gluyas Early	22	9	7	14	13	65
Haywood, T. ...	East Salmon Gums	Nabawa ...	22	8	9	12	13	64
McCorkill, E. ...	Salmon Gums	Nabawa ...	22	8	9	12	12	63
Morton, N. ...	East Salmon Gums	Nabawa ...	19	9	9	12	13	62
McMahon, D. ...	Kumarl ...	Nabawa ...	18	9	9	13	13	62
Potter, F. O. ...	Dowak ...	Nabawa ...	19	8	9	13	13	62
Thomas Bros. ...	Salmon Gums	Nabawa ...	18	9	9	12	13	61
Mosta, P. ...	Red Lake ...	Gluyas Early	19	9	9	12	12	61
Prince, E. ...	Kumarl ...	Nabawa ...	20	7	8	11	12	58
Ritchie, D. ...	Grass Patch	Gluyas Early	20	8	6	11	12	57
Watson, A. ...	Circle Valley	Gulyas Early	18	8	7	12	11	56
Quick & Sons ...	Red Lake ...	Nabawa ...	19	8	7	12	10	56
McCrea, N. ...	East Salmon Gums	Nabawa ...	17	7	8	12	11	55
Grigg, Bros. ...	Scaddan ...	Nabawa ...	17	8	5	12	11	53
Flintham, H. ...	Scaddan ...	Nabawa ...	16	7	7	12	10	52
Storey, F. E. ...	Treslove ...	Baroota Wonder	19	6	6	10	11	52
Bradshaw, J. ...	Kumarl ...	Nabawa ...	15	8	7	7	10	47

The winning crop of Mr. T. Waters, of West Dowak, of the variety Gluyas Early, was awarded 68 points, the calculated yield being 26 bushels per acre. This crop stood about 4ft. 6in. in height and was very well headed, but it lost heavily for admixture, though scoring well in other respects. The land originally carried silver bark and salmon gum and was ploughed 4in. deep in June with a disc implement. It was springtyne cultivated in November and harrowed prior to seeding. Graded and dry pickled seed was sown during the third week in May at the rate of 45 lbs., and superphosphate at 90 lbs. per acre.

Mr. M. O'Kieffe's crop of the same variety gained second place, while Mr. H. S. Sharpe, of East Treslove, who came third, gained the highest number of points for those competitors located in the southern portion of the area.

The rainfall for the various centres is shown in the table hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Dowak	2	...	229	145	209	156	67	221	74	19	746	13	288	1,423
Salmon Gums ...	...	...	300	187	281	143	98	246	65	17	850	8	...	1,345
Sunrise Hill ...	2	2	185	140	182	98	66	192	74	21	633	3	260	1,225
Circle Valley East ...	3	...	155	205	308	113	98	214	69	29	831	19	197	1,410
Red Lake ...	...	...	243	226	215	124	110	251	59	24	783	4	266	1,522
Grass Patch ...	3	2	295	271	251	129	112	278	108	35	913	6	237	1,727
Scaddan	2	...	325	333	289	150	80	251	73	30	873	20	221	1,774

A big improvement was noticed this year in the standard of the crops throughout the district. This also applies to the fallow prepared for the coming season's planting, and the good condition of most of the fallow seen during judging is an indication that the advice of the Department of Agriculture is having a beneficial influence. The average yield of the twenty-three competitors was 20 bushels per acre, an improvement of five bushels per acre over the previous year, when there were eleven competitors.

While in the course of judging, several other features in regard to the cropping methods were observed, namely—

1. *Admixture.*—This was due to two causes: (a) self-sown wheat, and (b) poor quality seed. In the early stages of farming without sheep, this is somewhat difficult to overcome, but the difficulty can be greatly lessened by more thorough cultivation. In this direction a heavier implement than the springtyne cultivator could be used to advantage during spring.

2. *Varieties.*—The standard and recommended varieties, Nabawa and Gluyas Early, were outstanding. Departure from these wheats, in most cases, led to various troubles, and in this respect the only other wheat grown in the competition, namely, Baroota Wonder Early, was very seriously affected by Rust.

3. *Diseases.*—Rust, Ball, and Loose Smut and Takeall were all too evident, and their control is more fully dealt with on pages 84 and 85 of this issue. These diseases were more common in the southern and older settled portions of this area than in the north. With such an efficient method as dry pickling with copper carbonate for the control of Ball Smut at the disposal of farmers, it really is surprising to find this disease prevalent in crops. An analysis of the cultural details shows that although copper carbonate was used by every competitor, infection was found in nine crops. This indicates that the operation of dry pickling was not done thoroughly.

In conclusion, the Society should be commended for fostering the crop competitions in this locality, for there is no doubt that much good will result therefrom.

The cultural details are summarised in the following table:

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.								
Waters, T. ...	1st	Silver bark and salmon gum	June	Good	Disc	4	Springtyne cultivated Nov. Harrowed before seeding *	Gluyas Early	4th week May	45	90	Copper carbonate	Yes	
O'Kieffe, M....	1st	Silver bark, teatree and gimlet	June	Good	Disc	4	Harrowed end April before seeding	Gluyas Early	3rd week May	40	80	Copper carbonate	Yes	Flag Smut
Sharpe, W. ...	1st	Light mallee and scrub	June	Good	Disc	3	Cross ploughed Oct. Springtyne cultivated prior to seeding	Nabawa	4th week April	50	90	Copper carbonate	No	Flying Smut
Smale Bros.	1st	Salmongum and gimlet	July-Aug.	Fair	Disc	4	Rigidtyne cultivated Nov and harrowed prior to seeding	Gluyas Early	3rd week May	40	85	Copper carbonate	Yes	
Sassella, J. ...	1st	Mallee gimlet, giant broom bush	July	Good	Disc	3-4	Springtyne cultivated Sept., prior to seeding	Gluyas Early	2nd week May	36	80	Copper carbonate	Yes	
Shaw, J. P. ...	2nd	Black mallee and broombush	June-July	Good	Disc	4	Cross ploughed in Feb. and springtyne cultivated prior to seeding	Nabawa	3rd week April	30	90	Copper carbonate	Yes	
Steele, S. C. ...	1st	Mallee and tea-tree scrub	June	Good	Disc	4	Harrowed in Sept., prior to seeding	Gluyas Early	1st week May	45	90	Copper carbonate	No	Bail Smut
Haywood T.	1st	Gimlet, silver bark, tea tree scrub	May June	Good	Twin Disc	4	Springtyne cultivated Nov. Skim ploughed April. Springtyne cultivated ahead of drill	Nabawa	4th week April	39	83	Copper carbonate	Yes	
McCorkill, E.	1st	Black mallee and scrub	June	Good	Disc	4	Springtyne cultivated Oct. and Mar., and again prior to seeding	Nabawa	1st week May	40	90	Copper carbonate	Yes	
Morton, N. ...	1st	Broombush and light silver bark	July	Fair	Disc	4	Springtyne cultivated Oct. and Nov., and prior to seeding	Nabawa	3rd week May	45	95	Copper carbonate	...	Flying Smut

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
McMahon, D.	1st	Silverbark, gimlet and mallee	June	Good	Disc	in. 3	*Nil*	Nabawa	4th week April	40	90	Copper carbonate	Yes	Flying Smut
Potter, F. C.	1st	Silverbark and tea-tree	July	Good	Disc	4	Springtyne cultivated in Nov., and prior to seeding	Nabawa	Last week April and 1st week May	30	85	Copper carbonate	Yes	Trace of Rust
Thomas Bros.	1st	Silverbark, gimlet, mallee and tea-tree	June	Good	Disc	4	Cross ploughed Feb., springtyne cultivated March	Nabawa	2nd week May	36	103	Copper carbonate	Yes	
Mosta, P. ...	1st	Scrub, light mallee	July	Good	Disc	4	Rigidtyne cultivated prior to seeding	Gluyas Early	2nd week May	42	75	Copper	No	Ball Smut
Prince, E. ...	1st	Black mallee, silver bark, gimlet and mallee	July	Fair	Mould-board	3–4	Springtyne cultivated Oct., Mar., and again prior to seeding	Nabawa	2nd week May	40	85	Copper carbonate	Yes	Trace Ball Smut
Ritchie, D. ...	1st	Silverbark	June-July	Good	Disc	4	Harrowed Oct. and Mar. Cross ploughed Mar. Springtyne cultivated in April	Gluyas Early	2nd week May	45	80	Copper carbonate	No	Rust and Ball Smut
Watson, A. ...	3rd	Silverbark and tea-tree	July	Good	Disc	3-4	Springtyne cultivated Sept., Oct., and Nov., and again prior to seeding	Gluyas Early	3rd week May	45	90	Copper carbonate	Yes	Takeall and Ball Smut
Quick & Sons	1st	Light mallee	July-Aug.	Good	Disc	3-4	Cross ploughed in Mar.: springtyne cultivated April, prior to seeding	Nabawa	Last week April, 1st week May	47	90	Copper carbonate	No	Ball Smut and Rust
McCrea, N. ...	2nd	Silverbark, gimlet and tea-tree	June	Good	Disc	4	Springtyne cultivated Nov., and again prior to seeding	Nabawa	1st week May	45	75	Copper carbonate	Yes	Ball Smut
Grigg Bros. ...	1st	Light mallee	June-July	Good	Disc	4	Cross ploughed and cultivated prior to drilling	Nabawa	Last week April	45	90	Copper carbonate	Yes	Rust and Ball Smut

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.								
Flintham, C.	1st	Tamma thicket, mallee and black mallee	May	Good	Twin Disc	4	Cross ploughed in Mar., and harrowed prior to seeding	Nabawa	3rd week May	51	103	Copper carbonate	Yes	Rust and Ball Smut
Storey, F. E.	1st	Light mallee scrub	July	Good	Disc	4	Cross ploughed Sept., Jan. and April	Baroota Wonder Early	3rd week April	70	110	Copper carbonate	No	Badly infected with Rust
Bradshaw, J.	2nd	Salmongum	June-July	Good	Disc	3–4	Springtyne cultivated Oct. and Feb.	Nabawa	3rd and 4th week April	39	80	Copper carbonate	No	Takeall and Rust

* All the crops were planted with disc drills.

ROYAL AGRICULTURAL SOCIETY ZONE CHAMPIONSHIP AWARDS.

Representatives from District Agricultural Societies' Competitions and entries received direct by Royal Agricultural Society.

Competitor.	District.	Society.	Variety.	Yield.	Freedom from Weeds.	Freedom from Disease.	Freedom from Admixture.	Evenness of Growth.	Total.
				50 points	10 points	10 points	15 points	15 points	100 points
ZONE 1.—Judge: I. Thomas, Superintendent of Wheat Farms.									
Bothe, B. D.	Coorow	Royal	Nabawa	35	8	8	14	13	78
Morcombe, P. T.	do.	do.	Felix	32	9	8	12	13	74
Hebiton, J. K.	Three Springs	Three Springs	Nabawa	31	8	8	12	13	72
Roberts, J. A.	Moora	Royal	Nizam	32	7	8	13	13	71
McKenzie, N.	Three Springs	Three Springs	Merredin	27	9	8	13	13	70
Forrester, J. K.	Carnamah	Royal	do.	29	7	8	13	12	69
Cuming, A. S.	do.	do.	Nabawa	25	7	8	11	11	62
Hopkinson, H. J.	Miling	do.	do.	16	9	9	13	10	57
ZONE 2.—Judge: F. L. Shier, B.Sc. Agric., Agricultural Adviser.									
Sutcliffe, J. G.	Dambering	Dalwallinu	Gluclub	33	8	9	12	14	76
Butcher, A. F.	Pithara	do.	do.	32	9	9	12	13	75
Porter, F. A.	Ajana	Royal	Nabawa	18	9	9	13	14	63
ZONE 3.—Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.									
Mt. Rupert Co.	Wongan Hills	Wongan Hills	Merredin	35	9	8	13	14	79
Glenvor Pastoral Co.	do.	do.	Nabawa	32	9	9	14	14	78
Williams, G.	Hindmarsh	Dowerin	Waratah	32	9	8	14	14	77
Dear, H. E.	Miamiwale	do.	Canberra	30	9	9	14	14	76
Jones, W. W.	Cowcowing	Wyalkatchem	Nabawa	31	9	9	12	14	75
Fordham, N.	Calcarra	Royal	Waratah	31	8	9	13	13	74
Lehman, C. E.	Cowcowing	Wyalkatchem	Gluclub	31	9	8	12	14	74
ZONE 4.—Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.									
Mannel, C. J.	Mukinbudin	Nungarin	Gluyas Early	30	8	9	14	14	75
Watson Bros.	Nungarin	do.	Carrabin	31	9	8	13	13	74
Davies, R. E. R.	Southern Cross	Royal	Nabawa	29	9	9	13	13	73
Smeeton, F.	Trayning	do.	Ford	27	9	8	13	13	70
White, E. T.	Mukinbudin	do.	Nabawa	26	9	9	12	13	69
Davies, F. & J.	Corinthian	do.	do.	26	9	9	13	12	69
Thompson, M. A.	North Bencubbin	Mt. Marshall	do.	24	8	9	13	13	67
Collins, M. C.	Bencubbin	do.	do.	24	8	8	13	13	66
Sulter, R. J.	Dulyalbin	Royal	do.	20	9	9	14	12	64
ZONE 5.—Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.									
Smith, C., & Sons	Yarding	Bruce Rock	Gluclub	43	9	9	13	14	88
Teasdale, H. W.	Totadgin	Merredin	Nabawa	39	8	9	13	14	83
Ellis, E. G.	Cent. Kumminin	Bruce Rock	Gluclub	39	9	8	12	14	82
Cook, W.	South Walgoolan	Merredin	Nabawa	38	9	8	13	14	82
Hammond, J. D.	Kellerberrin	Royal	Nabawa	25	8	7	13	12	65
ZONE 7.—Judge: J. H. Langfield, Manager, Experiment Farm, Merredin.									
Henderson, J. H.	Gnarming	Kulin	Queen Fan	37	9	9	14	14	83
Coad, H. J.	Lake Grace	Lake Grace	Nabawa	35	9	9	14	14	81
Bowey, & Baldock	Kulin	Kulin	Ford	33	9	9	13	14	78
Collinson & Fleay	Lake Grace	Lake Grace	Gluyas Late	33	9	9	14	13	78
Biglin, E. J.	Karlgarin	Karlgarin	Gluyas Early	32	8	8	12	13	73
Treasure, C.	do.	do.	Turvey	28	8	9	11	13	69

ROYAL AGRICULTURAL SOCIETY ZONE CHAMPIONSHIP AWARDS.—*continued.*

Representatives from District Agricultural Societies' Competitions and entries received direct by Royal Agricultural Society—continued.

Competitor.	District.	Society.	Variety.	Yield.	Freedom from Weeds.	Freedom from Disease.	Freedom from Admixture.	Evenness of Growth.	Total.
				50 points	10 points	10 points	15 points	15 points	100 points
ZONE 8.—Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.									
White, R. H.	Gnowangerup	Gnowangerup	Yandilla King	38	9	9	14	13	83
Barnard, C. E.	do.	do.	do.	37	8	9	14	12	80
Richards, T. ...	S. Caroling	Royal ...	Nabawa ...	33	8	9	14	13	77
Slee, E. J. W.	Nyabing	Nyabing ...	Major ...	36	7	8	12	13	76
Bryant, R. J.	Quairading	Royal ...	Gluyas Early	27	9	8	14	14	72
Sargent, A. McD.	Nyabing	Nyabing ...	Major ...	32	8	7	12	13	72
ZONE 9.—Judge: L. G. Seinor, Manager, Experiment Farm, Salmon Gums.									
Waters, T. ...	Dowak ...	Southern Mallee	Gluyas Early	26	9	9	10	14	68
O'Kieffe, M. ...	do. ...	do.	do.	23	9	9	12	14	67

OBJECTS OF THE COMPETITION.

The object of the competitions is the improvement of the standard of wheat farming methods practised throughout the Wheat Belt. A spirit of healthy rivalry is engendered, and competitors and others set themselves to follow those more successful than themselves. The methods practised by all the competitors are tabulated, the good farmers of the State receive recognition of their ability, and consequently a standard of practical wheat farming is established. It is demonstrated that where recommended methods are employed, reasonable success follows. The competitions also afford the officers of the Department of Agriculture to come into personal contact with the farmers.

SEASON.

The past season was almost ideal for wheat growing. After a dry summer the season opened with splendid early rains in March and April, which gave the weeds a good start and the opportunity for controlling them before seeding. Although May was a rather dry month, except in the Southern and Esperance areas, it permitted seeding operations to proceed uninterrupted, and the dry conditions also lent themselves admirably for weed destruction. Copious rains were general during June, and July, causing waterlogging and erosion in the wetter districts, but they assisted to carry over the crops to maturity when the late spring rains fell short of the average. The winter, on the whole, was a mild one, and the crops grew very tall. Wind injury was fairly wide spread on the lighter classes of land. Although there was a record harvest, still better yields would have been obtained had the late rains been more plentiful.

ENTRIES.

The total number of crops eligible to compete for the Zone Championship awards was 165, compared with 156 the previous year and 114 in 1928. This number is a record for the competition.

Entries were received from fifteen district Agricultural Societies, whilst sixteen individual entries were received direct by the Royal Agricultural Society. In addition, local competitions were conducted by the Goomalling, Wickepin, and Doodlakine-Baandee Agricultural Societies, Narembeen Agricultural Bureau, Yilgarn and Karloning Primary Producers' Associations and the Bonnie Rock Settlers' Association. The Bruce Rock Agricultural Society conducted a combined fallow and crop competition. These competitions included 72 competitors who were not eligible to compete for zone awards. The Bonnie Rock and Karloning competitions were on unfallowed land. The total number of crops inspected in all competitions in 1930 was 237.

The following table shows the growth of the competition since its inception in 1921:—

Year.	No. of District Agricultural Societies competing.	No. of Competitors.	Average Yield of Competitors.	Average Yield for State.
			bush.	bush.
1921	...	15	25	10·4
1922	...	32	24	8·9
1923	12	82	29	11·4
1924	15	70	31	12·8
1925	13	59	22·5	9·7
1926	11	99	24·5	12·0
1927	10	100	26·9	12·1
1928	13	114	22·5	10·1
1929	12	156	21·7	11·0
1930	15	165	27·4	12·7

District Agricultural Societies did not participate until 1923.

YIELDS.

Since 1925 the Royal Agricultural Society has awarded a special prize of £5 5s. to the competitor who obtains the highest calculated bushel yield per acre from the competing area of 50 acres. The award this year has been made to Messrs. C. Smith & Sons of Yarding, whose competing area of the variety "Gluclub," yielded 43 bushels per acre. This yield is three bushels less than the State record established in 1929 by Mr. C. E. Cockram of Pallinup with the variety "Yandilla King," which yielded 46 bushels per acre. The winners of this prize to date are as follow:—

1925—Hebiton & Sons, Three Springs	Nabawa	34 bush.	per acre.
1926—Cuming Bros., Carnamah ...	Yandilla King ...	38 „	„
1927—A. W. Parkinson, Gnowangerup	Yandilla King ...	40 „	„
1928—A. W. Parkinson, Gnowangerup	Yandilla King ...	40 „	„
1929—C. E. Cockram, Pallinup ...	Yandilla King ...	46 „	„
1930—C. Smith & Sons, Yarding ...	Gluclub	43 „	„

This year no less than 119 crops were calculated to yield 25 bushels or over per acre. Sixty-one competitors obtained yields of 30 bushels and over, and 18 yields of 35 bushels and over. Those competitors obtaining 30 bushels or over per acre are tabulated below:—

50-ACRE CROP COMPETITION, 1930.

Leading Competitors for Special Prizes awarded annually by Royal Agricultural Society for Highest Bushel Yield in any Zone.

Zone.	Competitor.	District.	Society.	Variety.	Calculated Yield per acre.
					bush.
5	Smith, C., & Sons ...	Yarding	Bruce Rock ...	Gluclub	43
5	Teasdale, H. W.	Totadgin ...	Merredin ...	Nabawa	39
5	Ellis, E. G.	Cent. Kumminin	Bruce Rock ...	Gluclub	39
5	Cook, W. T.	S. Walgoolan ...	Merredin ...	Nabawa	38
5	Strange, P. A.	Yarding	Bruce Rock ...	Gluclub	38
5	Smith, C. & A. H. ...	Yalbarrin ...	Bruce Rock ...	Gluclub	38
8	White, R. H.	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	38
7	Henderson, J. H. ...	Gnarming ...	Kulin	Queen Fan ...	37
8	Barnard, C. E.	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	37
5	Strachan, W.	Yarding	Bruce Rock ...	Gluclub	36
8	Slee, E. J. W.	Nyabing	Nyabing	Major	36
1	Bothe, B. D.	Coorow	Royal	Nabawa	35
3	Mt. Rupert Co.	Wongan Hills ...	Wongan Hills ...	Merredin ...	35
5	Farrall, F. C., & Sons ...	Yarding	Bruce Rock ...	Gluclub	35
5	Merredin Meat Co. ...	Merredin ...	Merredin ...	Canberra ...	35
5	Maughan, J. D.	S. Walgoolan ...	Merredin ...	Gluyas Late ...	35
7	Coad, H. J.	Lake Grace ...	Lake Grace ...	Nabawa	35
8	McDonald, J.	Gnowangerup ...	Gnowangerup ...	Nabawa	35
5	Teasdale Bros.	Belka	Merredin ...	Nabawa	34
5	Walder, L. S.	Merredin ...	Merredin ...	Merredin ...	34
8	Stewart, W. B.	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	34
2	Sutcliffe, J. G.	Damboring ...	Dalwallinu ...	Gluclub	33
7	Bowey & Baldock ...	Kulin	Kulin	Ford	33
7	Collinson & Fleay ...	Lake Grace ...	Lake Grace ...	Gluyas Late ...	33
8	Richards, T.	S. Caroling ...	Royal	Nabawa	33
1	Morcombe, P. T.	Coorow	Royal	Felix	32
1	Roberts, J. A.	Moora	Royal	Nizam	32
2	Butcher, A. F.	Pithara	Dalwallinu ...	Gluclub	32
3	Glenvor Pastoral Co. ...	Wongan Hills ...	Wongan Hills ...	Nabawa	32
3	Williams G.	Hindmarsh ...	Dowerin	Waratah ...	32
3	Cosh, E. C.	Minnivale ...	Dowerin	Waratah ...	32
3	Lane Bros.	Wongan Hills ...	Wongan Hills ...	Ford	32
3	Fowler, G. F.	Wongan Hills ...	Wongan Hills ...	Baroota Wonder	32
7	Bowey, P. J.	Kulin	Kulin	Ford	32
7	Biglin, E. J.	Karlgarin ...	Karlgarin ...	Gluyas Early ...	32
8	Formby, R. & Co., Ltd. ...	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	32
8	Sargent, A. McD. ...	Boongadoo ...	Nyabing	Major	32
1	Hebiton, J. K.	Three Springs ...	Three Springs ...	Nabawa	31
3	Jones, W. W.	Cowcowing ...	Wyalkatchem ...	Nabawa	31
3	Fordham, N. A.	Calcarra	Royal	Waratah ...	31
3	Lehman, C. E.	Cowcowing ...	Wyalkatchem ...	Gluclub	31
3	Hodgson, H.	N. Korrelocking...	Wyalkatchem ...	Merredin ...	31
3	Ackland, J. H.	Wongan Hills ...	Wongan Hills ...	Nabawa	31
4	Watson Bros.	Nungarin ...	Nungarin ...	Carrabin ...	31
5	Thyne Bros.	Norpa	Merredin ...	Merredin ...	31
7	Lewis, R. H.	Kulin	Kulin	Ford	31
7	Bishop, H. J.	Lake Grace ...	Lake Grace ...	Nabawa	31
7	Woodburn, J.	Lake Grace ...	Lake Grace ...	Yandilla King ...	31
7	Fry, E. H.	Lake Grace ...	Lake Grace ...	Gluyas Early ...	31
8	Taylor, C.	Pallinup	Gnowangerup ...	Yandilla King ...	31
2	Locke, F. C.	Dalwallinu ...	Dalwallinu ...	Merredin ...	30
2	Martin, K. J.	Dalwallinu ...	Dalwallinu ...	Ford	30
3	Bear, H. E.	Minnivale ...	Dowerin	Canberra ...	30
4	Manuel, C. J.	Mukinbudin ...	Nungarin ...	Gluyas Early ...	30
4	Johnson, J. H.	Mangowine ...	Nungarin ...	Gluyas Early ...	30
7	Nichols, R.	Kulin	Kulin	Gluyas Early ...	30
7	Parker, C. W.	Kulin	Kulin	Merredin ...	30
7	Trotter, A. W.	Kulin	Kulin	Bena	30
8	Whyatt, C. A.	Pallinup	Gnowangerup ...	Yandilla King ...	30
8	Johnston, A.	Gnowangerup ...	Gnowangerup ...	Nabawa	30
8	Murray, W. G.	Borden	Gnowangerup ...	Yandilla King ...	30

In 1929 the number of competitors with yields of 25 bushels and over was 50, and in the previous year 33. The average calculated yield for all crops inspected was 27.4 bushels per acre, as against an average of 21.7 bushels the pre-

vious year. This yield has been exceeded only on two occasions previously, namely, in 1923 and 1924, when the averages were respectively 29 and 31 bushels per acre.

The following table shows the comparison between the yields for the 1930-31 season, and the previous three years:—

Zone.	No. of Competitors. 1930.	Average Calculated Yields			
		1930.	1929.	1928.	1927.
1 ...	9	28·2	24·7	29·0	28·0
2 ...	10	27·6	22·5	19·3	22·4
3 ...	31	27·5	23·4	21·3	25·6
4 ...	21	26·1	18·2	18·3	29·2
5 ...	20	32·7	21·9	20·4	26·2
7 ...	30	28·6	22·0	23·0	25·6
8 ...	21	30·0	32·2	31·0	32·0
9 ...	23	19·8	14·5	...	...
	165	27·4*	20·7	22·5	26·9

* The results for 1929 included a number of local competitions planted on fallowed land. There were 156 competitors in the Royal and District Competitions that year—the average being 21·7 bus. per acre.

It is to be hoped that the efforts of those who carefully prepared their land, and who harvested good returns therefrom, will stimulate others to do likewise. It must be remembered, however, that the test of efficient farming comes when our season is least favourable. It is then that sound methods prove their value.

FALLOWING.

The conditions of the competition required the crops to be sown on fallowed land. In the preparation of the fallows most of the competitors ploughed their land during the winter months of June to August. It has been definitely demonstrated that higher yields are obtained if the land is ploughed early in the fallowing season than when ploughed later. In this connection in an experiment conducted at the Merredin Experiment Farm for six years (1924-1929), the average yield of plots ploughed the first week in June was 3 bushels 51 lbs. more than those ploughed the last week in August.

The average depth of the initial ploughing was from three to four inches, mouldboard and disc ploughs being used for this operation, while in a few cases rigidtyne scarifiers and springtyne cultivators were utilised for the initial cultural operation. The advantages of using a particular type of implement is determined by the type and condition of the soil to be dealt with. Whether the disc or mouldboard be selected, it is essential that the work be done thoroughly.

For the subsequent working of the fallow in preparation of a seedbed, the springtyne cultivator was the implement chiefly used. A disc implement was favoured, however, when the ground was hard or weedy. The rigidtyne cultivator is also designed for this purpose.

Sheep are becoming more numerous throughout the Wheat Belt each year, and their value in assisting to control weed growth on fallows is more widely appreciated.

VARIETIES.

The standard midseason variety, Nabawa, still maintained its popularity and was planted by 64 of the 165 competitors. Twenty-four competitors planted Gluyas Early, and 12 Yandilla King. Merredin and Gluclub, each by 10; Ford, 8; Queen Fan and Gluyas Late, 5; Canberra, 4; Major, Bena and Waratah, 3; Gresley, Baroota Wonder, and Carrabin, 2; and Daphne, Felix, Nizam, Dollar, Pusa, Turvey, Caliph and Drof 1.

Nabawa gained the principal honours in the District Crop Competitions, winning six first prizes, three seconds, and eight thirds. Gluyas Early was placed first three times, second once, and third twice; and Gluclub twice first, three times second, and once third.

Two zone championships were won by both Gluyas Early and Gluclub, the other zone awards being evenly divided among Nabawa, Merredin, Queen Fan, and Yandilla King, with one win each.

TIME OF SEEDING.

This is one of the most important factors for the successful production of the wheat crop. The seeding season is a comparatively short one, and as it is known that some varieties are more suitable for early planting, others for mid-season, and others for late planting, the seeding operations should be so arranged that the varieties selected are planted as near as possible to their optimum, *i.e.*, best seeding period.

The number of competitors who planted during April was 72, in May 83, and in June 9, and one in August. This shows that there has been a tendency to plant a little earlier this year than in the previous season. Eighty-two per cent. of the crops were sown by the middle of May, the later sown crops being located chiefly in the heavier rainfall districts where the seeding period is later. Of the 165 crops in the competition, 17 were late maturing wheats, 104 midseason, and 44 early. It has been demonstrated by experiments that when it is necessary, owing to the area sown, to extend the seeding period outside the month of May, it is better to plant suitable varieties in April rather than to extend the planting period into June. For further information, see the results of the Time of Seeding Experiments, published in this issue.

RATES OF SEEDING.

The rates of seeding varied from 22 lbs. to 75 lbs. per acre. The average rate was 48.1 lbs. per acre. The majority of the competitors planted from 45-60 lbs. per acre.

Experimental results indicate that for the midseason and early districts, while the yield is not decreased by heavier rates of seeding, no advantage is gained by increasing the amount over 45 lbs. per acre. In the very early districts the lighter rates give the best results, while for the late, *i.e.*, heavy rainfall districts, heavier rates can be practised with advantage.

RATES OF SUPERPHOSPHATE.

Superphosphate was applied by every competitor, the average rate of application being 97.3 lbs., an increase of 3.3 lbs. upon the previous year's average. The lightest and heaviest applications were 45 lbs. and 180 lbs. respectively, while the majority of the competitors used rates ranging between 80 and 100 lbs. per acre.

The rate of superphosphate has been gradually increasing in most districts. This has been partly due, no doubt, to the fact that the leading competitors who

have followed the recommendations of the Department of Agriculture, have been applying heavier dressings of superphosphate and obtained profitable results. Experiments at the various experiment farms have shown that increased yields were obtained when heavier dressings of superphosphate up to 150 lbs. were used, particularly on the lighter classes of soil.

The drastic change in the economic conditions of wheat farming, however, alters the interpretation of the results of these experiments because, where in the past liberal dressings of superphosphate were profitable, this is not so to-day.

An analysis of the results of the rate of superphosphate with wheat experiments shows that when superphosphate is valued at £5 a ton and wheat at 2s. a bushel, the limit of profitable application for the heavy forest country appears to be reached with an application of 112 lbs. per acre, and on the light land 120 lbs. per acre.

DISEASES.

Diseases found in the competition crops were Ball, Flag and Loose Smuts, Take-all and similar diseases (Foot Rot and Root Rot) and Septoria and Rust. Frost and wind injury were also observed.

Ball Smut.—It is surprising to find these days evidence of this disease in competition crops. Though the number of infected crops is yearly diminishing the economic loss to farmers from this and other preventable diseases is all too large. This disease can be prevented by the use of such fungicides as dry copper carbonate powder or the bluestone or formalin solutions. All are reliable fungicides, but of these by far the most popular is the dry copper carbonate dust. When correctly applied, at the rate of 1½ to 2 ounces per bushel, this method is very effective in preventing the disease. An added advantage with this method is that the seed wheat can be treated and stored immediately after harvest without any detrimental effect, and in addition the copper carbonate acts as a preventative against vermin. The presence of Ball Smut in a crop nowadays is not only indicative of faulty treatment, but also of "slipshod" methods. The results with this treatment have been so highly satisfactory that where care is exercised and the seed thoroughly dusted, the disease can be entirely eliminated.

Flag Smut.—This disease is becoming more in evidence each year. Unlike Ball Smut, where the chief source of infection is from spores on the seed, this disease is a soil infection. Spores from various agencies find their way into the soil, and remain there to attack the wheat crops. It can be seen, therefore, that its control lies not so much from seed treatment, but more along the lines of crop rotation. As a precaution all seed should be treated with dry copper carbonate, and while there is evidence that this diminishes re-infection to a limited extent, it will not control it. The most effective means of control of this disease are by cultural methods in conjunction with the growing of resistant wheats, and it is indeed fortunate that such a popular variety as Nabawa is Flag Smut resistant, as is also the late maturing variety Yandilla King. Other resistant wheats are Bencubbin, Carrabin, and Geeralying, all of which are recommended for planting on infected areas. Gluyas Early, Merredin and Canberra, all early varieties, are very susceptible to this disease.

A certain means of spreading infection throughout the farm is by feeding infected wheaten hay to stock. Oaten hay should be used, as in addition, the growing of oats also assists in the control of the disease Take-all. Badly infested wheat stubbles should be burnt and so prevent stock spreading the spores over the farm, either through the agencies of the manure or by carrying it on their bodies. Early fallow and judicious cultivation to keep down weeds and self sown wheat plants are essential. Where it is known that a paddock is infected, it is advisable to delay seeding until after the first seeding rains.

Briefly, the methods of control are as follow:—

1. Fallow early and well.
2. Keep fallows free of weeds and self-sown wheat.
3. Plant resistant varieties.
4. Plant as late as is safe to plant in the sowing season.
5. Discontinue feeding infected hay to stock.
6. Include oats in the crop rotation.
7. Burn the stubble of infected crop.

Loose Smut.—Loose Smut or Flying Smut is more difficult to control, as there is no practical method of seed treatment. Seed from badly infected crops should be discarded, and fresh seed obtained from clean crops.

Take-all.—Take-all was more in evidence this year than in the previous season. This disease is also the result of soil infection, and its control is very similar to that for Flag Smut. There is, however, no variety, as yet, known to be resistant to this disease, and its control depends, therefore, in the farming practice adopted. In this respect the value of a crop of oats (free of barley or wheat) is of utmost importance.

It was not surprising to find that in some cases where competing crops were badly infested with Take-all, the reason was because no control methods had been taken. Farmers are advised not to wait until their cropping areas become badly infected before taking steps to control the disease, but to adopt preventative methods which include the growing of oats in their cropping rotation.

Rust.—This is a disease, the prevalence of which depends mainly on the seasonal conditions, over which there is no control. In districts where rust is likely to occur, farmers should avoid growing rust-liable wheats.

Septoria.—The disease Septoria is most liable to occur when the wheat crop is planted too early. Under these conditions there is a tendency for the plants to make flaggy and rank growth, and as a result they become more susceptible to infection by the fungus. The control consists of seasonable planting and the practice of clean farming methods.

It is not possible, in the space of this article, to discuss the various diseases fully, but should any reader desire further information concerning these diseases, bulletins are available for free distribution, and can be obtained on application. The bulletins mentioned are:—

Septoria—No. 121.
Rust of Cereals—No. 126.
Flag Smut—No. 134.
Cereal Smuts—No. 160.
Foot Rot and Root-Rot of Wheat—No. 228.
Partial or complete emptiness in wheat heads—No. 301.
Earcockle and Bacterial Diseases of Wheat—No. 196.

These 50-acre Crop Competitions have demonstrated over widely distributed centres, and on all classes of soils throughout the wheat belt, that higher yields are possible when sound methods are adopted. Other cropping competitions which deal with the average yield of the whole area cropped on the farm, such as the Wheat Yields Competition (1924-26), the Bateman Trophy Competition (1929), and the District Challenge Shield Competition (1928-30) have proved that these methods, when also applied to the whole cropped area, are more profitable.

Costs of production are the vital factors in the success of any industries. Higher average yields mean lower costs per bushel. Therefore, by the adoption of sound methods it is within the compass of every farmer to lower, to some extent, the costs of production and hence increase the margin of profit.

Herein lies the real value of crop competitions.

FISTULOUS WITHERS—A POSSIBLE SOURCE OF DANGER TO THE DAIRY FARMER.

H. W. Bennetts, M.V.Sc., and J. F. Filmer, B.V.Sc.

Fistulous withers and poll evil have long been recognised as extremely troublesome conditions in the horse. Their treatment generally requires several surgical operations and prolonged hospital treatment. This is usually so costly as to make it quite uneconomical, and the owner often resorts to destruction.

The cause of these complaints has been the object of a fair amount of research. Originally it was held that they were the result of injury. This is probably true of a small percentage of cases. However, so many cases occur in which the possibility of injury is very remote, that it became necessary to search for other causes.

Recent work along these lines has revealed a possible cause, which has a rather startling significance. It is fairly generally known that Contagious Abortion in cattle is due to a germ, and that the presence of this germ may be detected by a blood test known as the agglutination test. In 1928 this test was applied by two French veterinarians to fifteen horses suffering from fistulous withers or poll evil. Of these, twelve blood samples gave positive reactions. It was further noted that in all of the positive cases the horses came from farms where Contagious Abortion was present amongst the cattle. In two cases it was definitely established that the germs of Contagious Abortion were being given off in the discharges. There was some evidence that this was happening in several other cases.

In 1929 this investigation was repeated in America. Out of forty-six cases, thirty-nine gave positive blood tests. In ten of these cases the pus was examined, and in three cases the germ of Contagious Abortion was found to be present.

When this work was brought to the notice of the writers it was decided to investigate the position in Western Australia. So far only two cases have been examined. One of these was an old case of fistulous withers discharging from both sides. The other case was of the type sometimes known as a "Blackboy fistula." A large swelling had formed on the withers and subsided without bursting. A swelling then appeared on the poll, and later, burst.

The significance to the dairy farmer of this new discovery is readily apparent. The spread of Contagious Abortion has been shown to occur through cows eating pasture contaminated by the germ of the disease. If then this germ is present in the discharges from fistulous withers and poll evils, these must be treated as infectious diseases.

It is not suggested that all such cases are due to the germ of Contagious Abortion, but dairy farmers should err on the safe side. All such cases should be isolated so that there is no possibility of the discharges contaminating the food of cows.

The Veterinary Pathologist of the Department of Agriculture will be pleased to receive samples of blood serum from cases of fistulous wither or poll evil. Blood may be obtained by severing a small artery in the ear or by puncturing the jugular vein in the neck. It should be collected in a clean bottle which has been boiled. About four tablespoonsful of blood is sufficient. This should be allowed to stand for twelve hours, and the clear straw-coloured serum should then be poured off into another clean bottle and forwarded immediately.

Further work will be carried out as occasion offers. The present results are being published at this early stage of the investigation in order that dairy farmers may take the precautions which appear to be necessary.

LOCAL CROP COMPETITIONS.

I. THOMAS, Superintendent of Wheat Farms.

In addition to the 50-acre Crop Competitions conducted by the Royal and District Agricultural Societies, competitions were also conducted by unaffiliated bodies or by Agricultural Societies who submitted their entries too late for acceptance by the Royal Agricultural Society. Some of these competitions were judged under different conditions from those under which the Royal and District Competitions were conducted, inasmuch that it was not necessary for the crops to be on fallowed land. Although this may seem to be a departure from the policy of giving encouragement to sound farming methods, it must be understood that most of these competitions were conducted in newly settled areas under pioneering conditions where little or no fallowed land had yet been prepared.

The value of having crop competitions in the early stages of settlement is a very potent one inasmuch as it affords a departmental officer the opportunity of visiting the settlers and after inspecting the crops, giving them advice as to improvement of their methods. By creating an atmosphere of friendly rivalry and by focussing attention to good methods, in the early stages, much more rapid improvement can be expected from these newly settled areas.

It must be pointed out, however, that, providing a competitor can fulfil the requirements laid down by the Royal Agricultural Society, namely, that the crop is sown on fallowed land and consists of one variety of at least 50 acres in area, he is not debarred from competing for the substantial Zone prizes available. The Zones into which the wheat belt is divided are so arranged that competitors farming in areas of similar rainfall, climatic and soil conditions, compete with one another and hence all have the same advantage.

This year local crop competitions were conducted by the following bodies:—Goomalling Wickepin and Doodlakine-Baandee Agricultural Societies (whose entries were made too late to be eligible for the Royal Competition), the Narembeen Agricultural Bureau, the Yilgarn and Karloning Primary Producers' Associations and the Bonnie Rock Settlers' Association. In addition the Bruce Rock Agricultural Society conducted a combined Fallow and Crop Competition.

In all there were 72 entries, the average yield for all competitors being 23.4 bushels per acre. The Bonnie Rock and Karloning Competitions were on unfallowed land, the averages for the competitors on fallowed and unfallowed land being as follows:—

	Average Yield per acre. Bus.
Fallowed (45 competitors)	26.6
Not fallowed (27 competitors)	18.0
Average	23.4

The judges' reports and awards, together with a detailed summary of the cultural details will be found on the following pages.

DOODLAKINE-BAANDEE AGRICULTURAL SOCIETY.

I. Thomas, Superintendent of Wheat Farms.

This Society is located in Zone 5, but the entries were received too late by the Royal Agricultural Society to be included in the Zone Competition.

Eight competing areas were submitted for inspection and the awards made are hereunder:—

DOODLAKINE-BAANDEE AGRICULTURAL SOCIETY.

Judge: I. Thomas, Superintendent of Wheat Farms.

Name.	Address.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Arthur, E. J. ...	Baandee ...	Gluyas Early	33	8	8	14	14	77
Stevens, P. T. ...	Doodlakine	Nabawa ...	30	9	9	13	14	75
Prowse Bros. ...	do. ...	Gluyas Early	31	8	8	14	13	74
Harrison, T. H. ...	do. ...	Carrabin ...	29	8	8	11	14	70
Mableson, H. H. ...	Baandee ...	Nabawa ...	27	9	8	13	13	70
Prowse, A. E. C. ...	Doodlakine	do. ...	26	8	8	14	14	70
Prowse, Edgar ...	do. ...	do. ...	25	8	7	13	13	66
Kay, J.	Baandee ...	Gluyas Early	26	7	7	13	13	66

The winning crop was a very attractive one of the variety Gluyas Early, and was part of 220 acres of the same variety which, from a casual inspection, was similar to the area submitted for inspection. Planted the last week in April with 45lbs. of graded pickled seed with 70 lbs. of superphosphate per acre, it had made strong growth and was fairly regular in height and stooling. It was also fairly free of admixture and weeds. A trace of the disease Flag Smut was present.

The 50 acres of the variety Nabawa, submitted for inspection by Mr. P. T. Stevens, was also an attractive exhibit. Very few weeds were present, and with the exception of Septoria on the foliage no disease was noted. There was, however, an occasional plant of barley, but the crop was very even in height and had stooled well. It had been planted with 60 lbs. recleaned seed which had been treated for the prevention of Ball Smut, together with an application of 60 lbs. of superphosphate per acre.

The rainfalls for Doodlakine and Baandee respectively are as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	Jun.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total for year.
Doodlakine ...	...	100	76	245	44	317	197	194	69	22	843	2	65	1,331
Baandee	...	...	165	220	58	295	155	197	54	12	771	...	22	1,178

The cultural details of the competitors are summarised in the following table:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.					lb.	lb.			
Arthur, E. J.	Fallow, crop, pasture	Salmon, gimlet, and morrel	June	Disc cultivating	3	Good	Harrowed twice immediately after ploughing; springtyne cultivated Sept. Harrowed March; springtyne cultivated fortnight later	Ghyas Early	Last week April	45	70	Copper carbonate	Yes	Trace Smut. Flag
Stevens, P. L.	Old Land	Salmon and gimlet	June-July	Mould-board	3½	Good	Harrowed after ploughing then cultivated. Cultivated again Sept. and before planting. Harrowed after seeding	Nabawa	2nd week May	60	60	Copper carbonate	Re-cleaned	Septoria
Prowse Bros.	Part 4th best 13 crops. Balance 4th crop	Salmon, gimlet, and jam	June	Mould-board	3½	Good	Springtyne cultivated Sept. Sheep running on fallow. Planted with combined cultivator drill	Ghyas	Last week April	45	100	Copper carbonate	Yes	Traces Ball Smut Takeall
Harrison, T. H.	3 years (Fallow, crop pasture)	Gimlet, salmon, and morrel	June-July	Mould-board	4	Good	Springtyne cultivated Sept. Skim ploughed. Planted with combined cultivator drill	Carrabin	2nd week May	60	75	Copper carbonate	Re-cleaned	Flag Smut
Mabileson, H. jr.	4th year cropped 2 year rotation	Salmon and gimlet	July	Mould-board	3	Good	Cultivated with rigid tyne implements Sept. Springtyne cultivated November and March	Nabawa	1st week May	45	90	Copper carbonate	Yes	Takeall
Prowse, A. E. C.	Fallow and crop	Salmon and gimlet	Late June	Mould-board	3½	Good	Springtyne cultivated Sept. Seeded with combined cultivator drill	Nabawa	Middle April ...	45	100	Copper carbonate	Yes	Takeall
Prowse, E. ...	Fallow and crop 10 yrs. 2 years pasture prior last fallow	Salmon, gimlet, boree and jam scrub	Early July	Disc	3½	Good	Springtyne cultivated early October. Planted with combined cultivator drill and harrowed immediately after	Nabawa	Last week April	37	90	Copper carbonate	Yes	Septoria. Takeall

CULTURAL DETAILS—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Kay, J. ...	Oats, fallow wheat, wheat	Salmon, gimlet, morrel and tea tree	July	Mould-board	In. 3½	Good	Springtyne cultivated Sept. and Nov., followed by a harrowing. Disc cultivated and rigid tyne cultivated prior to seeding. Planted with disc drill	Gluyas Early	4th week May	lb. 45	lb. 90	Copper carbonate	Yes	Traces Take-all and Flag Smut

GOOMALLING AGRICULTURAL SOCIETY.

Judge: A. S. WILD, B.Sc. (Agric.), Agricultural Adviser.

Only three crops were submitted for inspection in the competition conducted by the Goomalling Agricultural Society. The awards were made as hereunder:—

GOOMALLING AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Johnson, F. B.	Burabadji ...	Ford	33	9	8	13	13	76
Miller, J. F. ...	Oak Park ...	Ford	30	9	8	14	14	75
Lord, F. J. ...	Burabadji ...	Ford	30	9	9	13	13	74

All the competiting areas were of the variety Ford.

Mr. F. B. Johnson, of Burabadgi, who secured first place, had prepared his land (old jam, york gum, and salmon gum country) by ploughing to a depth of 4½ inches with a mouldboard plough during July, 1929. This was followed by a springtyne cultivation in September, a cross-harrowing in October, and a further springtyne cultivation in March and again just before seeding. The crop was planted during the first week in May, 70 lbs. of pickled, graded seed being sown per acre, together with 80 lbs. of superphosphate. The crop, a comparatively tall one, was calculated to yield 33 bushels per acre.

The rainfall recorded at Goomalling is as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Goomalling, 1930 ...	...	2	89	112	94	328	242	226	132	22	1,044	7	57	1,131

The cultural details of all three competitors are summarised hereunder:

CULTURAL DETAILS.

Competitor.	No. years cropped	Timber.	When ploughed	Condition of land	Implement used	Subsequent cultivations	Variety.	Planted	Rate of seed	Rate of super	Seed treatment	Guard.	Disease.
Johnston, F. B.	Old land	Jam, york gum and salmon	July	Excellent	Mould board	Springtyne cultivated to depth of 3 inches Sept., cross harrowed Oct. springtyne cultivated to depth of 3 inches and harrowed before seeding	Ford	1st week May	45 lb. 70 lb.	45 lb. 90 lb.	Copper sulphate bluestone	Yes	Traces of Bull Smut and Takeall
Miller, J. E.	4	Mallee, red morn, jam and york gum	Late July	Excellent	Mould board	Springtyne cultivated Sept. harrowed before seeding	Ford	3rd week April	50	90	Copper sulphate bluestone	Yes	Traces of Take all and Sep toria
Lord, E. J.	5	John gimlet and salmon	July and Aug.	Good	Mould board	Springtyne cultivated Sept. and harrowed Aug.	Ford	21st April	60	90 to 95 lb.	Copper sulphate bluestone	Yes	Traces of Take all

WICKEPIN AGRICULTURAL SOCIETY.

Judge: A. S. WILD, B.Sc. (Agric.), Agricultural Adviser.

Although only four crops were inspected for the competition conducted by the Wickepin Agricultural Society, some high yields were recorded.

The awards made are set out below:—

WICKEPIN AGRICULTURAL SOCIETY.

Judge: A. S. Wild, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield, 50 pts.	Freedom from weeds, 10 pts.	Freedom from disease, 10 pts.	Freedom from admixture, 15 pts.	Evenness of growth, 15 pts.	Total, 100 pts.
Elliot Bros. ...	Gillimanning ...	Gallipoli ...	37	9	8	13	14	81
Clifford, T. ...	Gillimanning ...	Gallipoli ...	34	9	8	12	12	75
Phoebe, J. C.	Dorakin ...	Free Gallipoli	25	9	8	13	12	67
Hosken Bros.	Dorakin ...	Canberra ...	21	9	8	14	14	66

The crops both of Messrs. Elliot Bros. and Mr. T. Clifford were of the variety Gallipoli, the former being calculated to yield 37 bushels, and the latter 34 bushels per acre. The winning crop had been planted during the third week in April at the rate of 54 lbs. of recleaned seed per acre, together with 80 lbs. of superphosphate. It was very even in growth and free of weeds, but contained traces of Takeall and Flying Smut, and also lost points for admixture in the form of barley and odd heads of "strange" varieties of wheat.

The rainfall recorded at Wickepin is shown hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Wickepin, 1930 ..	...	52	118	125	47	504	585	162	124	15	1,437	...	20	1,752

The cultural details of the competing crops are tabulated hereunder:—

CULTURAL DETAILS.

Competitor.	No. years cropped.	Timber.	When ploughed	Condition of land.	Implement	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Elliott Bros....	1	Yorkgum & jam	July	Good	Mould-board	in. 3	Springtyne cultivated once before seeding. Planted with combined cultivator drill	Gallipoli	3rd week April	lb. 54	lb. 80	No	...	Traces of Take-all and Flying Smut
Clifford, P. ...	2	Jam, mallee and yorkgum	July	Fair	Mould-board	4½	Springtyne cultivated once. Planted with combined cultivator drill	Gallipoli	End April ...	60	115	Copper carbonate	Yes	Traces Takeall and Bunt and Smut
Phoebe, J. C.	3	Whitegum and morrel	July	Excellent	Mould-board	4	Portion springtyne cultivated Sept. and re-mainder Nov.; mould-board ploughed 3in. deep before seeding. Planted with combined cultivator drill	Canberra-Gallipoli	Mid-April ...	60	90	Copper carbonate	Yes	Takeall patches
Brokers Bros.	Old land	Morrel and mallee	July	Good	Mould-board	4	Springtyne cultivated Sept. and Apl. Planted with combined cultivator drill	Canberra	Early May ...	70	112	Formalin	Yes	Traces of Take-all, Flying Smut and Flag Smut

NAREMBEEN AGRICULTURAL BUREAU.

Judge: N. DAVENPORT, B.Sc. (Agric.), Agricultural Adviser.

The above Society organised a 50-acre crop competition in conjunction with a fallow competition conducted the previous autumn. The crop competition was purely a local one and was not connected with the State-wide competition sponsored by the Royal Agricultural Society.

The season experienced was a good one, as is borne out to some extent by the monthly rainfall registrations given below:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Narembeen, 1930 ...	...	3	180	153	72	288	302	206	117	28	1,013	...	20	1,369

Most of the crops were more or less affected with the disease Takeall. The prevalence of this disease in the district shows the necessity for improvement in the cropping practice of disease control. Reference to the control of this disease is made on page 85.

The winning crop, that of Mr. H. Hebberman, was of the variety Ford which, although showing a rather excessive growth of straw, was well headed and its evenness of growth added to its attractive appearance. The presence of the disease Flag Smut was noticed.

The tables showing the points awarded and the cultural details of the respective competitors are given below:—

NAREMBEEN AGRICULTURAL BUREAU.

Judge: N. Davenport, B.Sc. (Agric.), Agricultural Adviser.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Hebberman, H. ...	Emu Hill ...	Ford ...	30	9	8	12	13	72
Burgin & Yoeman	Narembeen	Nabawa ...	26	7	8	13	12	66
Dayman, G. S. ...	do. ...	do. ...	26	7	7	12	12	64
Howell, A. ...	do. ...	Waratah ...	26	7	7	12	11	63
Price, J. H. ...	do. ...	Nabawa ...	24	8	6	11	11	60
Cavanagh, F. O....	Emu Hill ...	do. ...	20	8	7	13	12	60
McConnell, Mrs. I. H.	Narembeen	Waratah ...	20	6	7	13	12	58

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
Hebberman, H.	Old land	Salmon, gimlet and mallee	June	Mould-board	in. 2½	Good	Disc cultivated Aug.: springtyne cultivated Sept. Planted with combined cultivator drill	Ford	1st week May...	58	90	Copper carbonate	Yes	Takeall and Ball Smut
Burgin and Yeoman	Old land	Salmon, gimlet, mallee and morrel	July	Scarifier	4	Good	Rigid-tyne scarified Sept. and March and before seeding. Planted with a disc drill	Nabawa	Last week April	40	55	Copper carbonate	Yes	Traces Ball and loose Smut and Takeall
Dayman, G. S.	5	Salmon, gimlet and mallee	June-July	Disc	4	Good	Cross disced Aug.: springtyne cultivated end of Sept. and again ahead of the hoe drill	Nabawa	2nd week May...	52	90	Copper carbonate	Yes	Takeall and Ball Smut
Howell, A. ...	3	Salmon, gimlet, mallee and morrel	June	Mould-board	4	Good	Springtyne cultivated Sept.; rigid-tyne scarified Oct.; cultivated prior to drilling with a disc drill	Waratah	2nd week May...	60	120	Copper carbonate	Yes	Flag Smut, Takeall, little loose Smut
Price, J. H. ...	3	Salmon, gimlet and mallee	June-July	Disc	3	Good	Cross disc cultivated Aug.; harrowed Sept.: springtyne cultivated after rain early Nov. and during first week May. Seeded with combined cultivator drill	Nabawa	2nd week May...	50	90	Formalin	Yes	Takeall and and trace Ball Smut
Cavanagh, F. O.	6	Salmon and gimlet	July	Mould-board	4	Fair	Cultivated with disc implement July; springtyne cultivated in Sept. and prior to seeding	Nabawa	1st week May ...	45	90	Copper carbonate	Yes	Takeall
McConnell, Mrs. I. H.	5	Salmon and gimlet	Oct.	Disc	2	Rather dry	Springtyne cultivated after rain in March and before drilling with a disc implement	Waratah	1st week May ...	58	90	Copper carbonate	Re-cleaned	Flag Smut, Takeall, and loose Smut

KARLONING PRIMARY PRODUCERS' ASSOCIATION.

Judge: N. Davenport, B.Sc. (Agric.), Agricultural Adviser.

The above Association again conducted a 50-acre crop competition this year for further competition for the cup presented by Mr. John Driver.

The awards made are shown in the table hereunder:—

Competitor.	District.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points.	Freedom from Disease. 10 points.	Freedom from Admixture. 15 points.	Evenness of Growth. 15 points.	Total. 100 points.
[illegible]	Karloning ...	Gluyas Early	23	8	9	13	14	67
[illegible], L. E. ...	do. ...	do. ...	23	9	8	12	14	66
[illegible], F. A. ...	do. ...	do. ...	18	9	8	14	13	63
Watkins, Mrs. O. I.	do. ...	Nabawa ...	21	8	9	11	12	61
Bell, G.	do. ...	Gluyas Early	18	8	9	12	13	60
[illegible], J. ...	do. ...	do. ...	17	9	9	12	13	60
[illegible], H. ...	do. ...	Nabawa ...	16	9	9	14	12	60
[illegible], P. ...	do. ...	Gluyas Early	19	8	9	11	13	60
[illegible], H. ...	do. ...	Nabawa ...	17	9	9	13	12	60
[illegible], J. ...	do. ...	do. ...	16	8	9	14	12	59
[illegible], H. ...	do. ...	Gluyas Early	18	8	8	12	12	58
[illegible], L. L. ...	do ...	do. ...	14	9	9	13	12	57
[illegible], H. ...	do. ...	do. ...	17	9	8	11	12	57
[illegible], V. ...	do. ...	Nabawa ...	15	9	9	11	11	55

Under the rules of the competition, crops grown both on fallowed and unfallowed land are eligible to compete. The fact that the first and second prize winners were the only crops grown on fallowed land demonstrates the value of cropping on fallowed land.

In a new district this is, of course, often difficult to effect, and where land is continuously cropped advantage should be taken of any summer rains to break up the soil to a shallow depth in readiness for seeding.

In general, the yields of the competitors were fair only, as weeds have not yet become plentiful, nor is disease very evident. Admixture is fairly common, and is mainly due to self-sown wheat from the previous crop.

The winning crop of the variety Gluyas Early, entered by Mr. B. G. Hewitt, was grown on land ploughed in June and planted during the third week in April. It was one of the most even crops entered in the competition and was well headed.

The rainfall recorded at Karloning is as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.						Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sept.	Oct.			
Karloning ...			83	277	38	409	137	161	68	15	828	9	127	1,329

The cultural details have been summarised in the following table:—

CULTURAL DETAILS.

Competitor.	Years cropped.	Timber.	Subsequent cultivations.	Variety.	Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
Hewitt, B. G. ...	2nd year	Salmon and gimlet ...	Disc ploughed mid-June 3in., springtyne cultivated August; harrowed Nov.; seeded with combined cultivator drill	Gluyas Early ...	3rd week April	30	60	Copper carbonate	Yes	
Blight, L. R. ...	4th year	Salmon and gimlet	Disc ploughed 2½in.–3in. July; springtyne cultivated August and March; Seeded with combined cultivator drill	Gluyas Early...	2nd week May	38	75	Copper carbonate	Yes	Ball Smut
Driver, F. A. ...	1st year	Salmon and gimlet	Planted with combined cultivator drill	Gluyas Early...	3rd week May	35	70	Copper carbonate	Yes	Frost injury
Watkins, Mrs. O. I.	1st year	Salmon and gimlet	Seeded with combined cultivator drill ...	Nabawa ...	4th week April	30	44	Copper carbonate	Yes	
Bell, G. ...	1st and 2nd year	Salmon and gimlet	Seeded with combined cultivator drill	Gluyas Early...	1st week May	39	60	Copper carbonate	Yes	
Borlace, J. ...	2nd year	Salmon and gimlet...	Cultivated week prior to seeding; seeded with combined cultivator drill	Gluyas Early...	2nd week May	39	63	Copper car bonate	Recleaned	
Driver, H. ...	1st year	Salmon and gimlet	Springtyne cultivated week previous to seeding; planted with disc drill	Nabawa ...	3rd week April	30	60	Copper carbonate	Yes	Frost injury
McInnes, P. ...	3rd year	Salmon and gimlet	Springtyne cultivated March; seeded with combined cultivator drill	Gluyas Early...	1st week May	36	60	Copper carbonate	Yes	
O'Neil, H. ...	1st year	Mallee, jam and tea-tree	Seeded with combined cultivator drill ...	Nabawa ...	1st week May	36	60	Copper carbonate	Recleaned	
O'Neil, J. ...	1st year	Salmon, and gimlet, mallee and scrub	Springtyne cultivated end Oct. and March after rain; planted with disc drill	Nabawa ...	3rd week April	30	50	Copper carbonate	Yes	Frost injury
Seaby, H. ...	3 yrs. continuously	Salmon, gimlet and mallee	Seeded with combined cultivator drill ...	Gluyas Early...	1st week May	36	45	Copper carbonate	Yes	Ball smut
Hewitt, E. E. ...	1st year	Mallee, tea-tree, light scrub	Seeded with disc drill	Gluyas Early...	2nd week April	40	60	Copper carbonate	Yes	Little Septoria
Johnson, H. T.	1st year	Salmon and gimlet, little white gum and scrub	Seeded with combined cultivator drill ...	Gluyas Early...	2nd week May	30	70	Copper carbonate	Yes	Frost injury
Broomhall, V. ...	1st year	Salmon, gimlet, mallee and jam	Seeded with combined cultivator drill ...	Nabawa ...	3rd week April	36	55	Copper car bonate	Recleaned	Frost injury

BONNIE ROCK SETTLERS' ASSOCIATION.

Judge: N. DAVENPORT, B.Sc. (Agric.), Agricultural Adviser.

The settlers of this district, which is situated about 40 miles North-East of Mukinbudin, are to be commended for their enthusiasm in organising a competition of this nature, especially so as this is the first year of general cropping in the district.

Of the thirteen entries one crop only was planted on fallow. The fact that this crop, entered by Mr. H. Baber won the competition demonstrates the advantage of fallow over non-fallow. This crop, comprising areas of Gluyas Early and Nabawa, was well grown, although the Nabawa section was rather uneven, weeds and disease were practically absent.

The awards are as follow:—

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Baber, H. ...	Bonnie Rock	Gluyas Early	23	9	9	13	12	66
Edmeads, G. ...	do. ...	do. ...	21	9	9	12	12	63
Fuss, K.	do. ...	do. ...	19	9	9	13	12	62
Machinson, A. ...	do. ...	Nabawa ...	19	9	9	13	12	62
Terry Bros. ...	do. ...	do. ...	18	9	9	13	12	61
Atherton, A. ...	do. ...	do. ...	17	9	9	13	12	60
Caunt, F. W. ...	do. ...	Gluyas Early	19	9	9	11	12	60
Driver, A. ...	do. ...	do. ...	18	9	9	12	12	60
Macham, J. ...	do. ...	Noongaar ...	17	9	9	13	12	60
Jackman & Wood	do. ...	Gluyas Early	15	9	9	13	12	58
Calder & Johnson	do. ...	do. ...	17	9	8	12	11	57
Sprigg, W. F. ...	do. ...	do. ...	17	9	9	11	11	57
Pollard & Naylor	do. ...	do. ...	15	9	6	11	11	52

As would be expected from the first year cropping on such country, the crops were generally very similar. Weeds and disease were very little in evidence.

The seed used was in most cases rather impure, barley being an especially objectionable admixture.

The rainfall for Bonnie Rock was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Bonnie Rock, 1930	...	20	171	273	35	261	167	149	64	14	690	...	57	1,211

The cultural details have been summarised in the following table:—

CULTURAL DETAILS.

Competitor.	Years Cropped.	Timber.	Subsequent Cultivations.	Variety.	Planted.	Rate of Seed.	Rate of Super.	Seed Teatment	Graded.	Disease.
						lb.	lb.			
Baber, H. ...	1st year	Mallee scrub and bullock	Ploughed with light disc plough 3in. deep June; disc cultivated prior to seeding with a disc drill	Gluyas Early and Nabawa	2nd week April	41	120	Copper carbonate	Yes	
Edmeads, G. ...	1st year	Salmon, gimlet, jam and mallee	Seeded with combined cultivator drill ...	Gluyas Early...	2nd week April	30	50	Copper carbonate	Yes	
Fuss, K. ...	1st year	Salmon, gimlet and mallee	Ploughed with light disc plough 2in.-3in. deep March; seeded with combined cultivator drill	Gluyas Early ...	2nd week May	32	55	Copper carbonate	Yes	
Machinson, A. ...	1st year	Salmon, gimlet and mallee	Ploughed with light disc plough early March; seeded with combined cultivator drill	Nabawa and Gluyas Early	1st week May	35	45	Copper carbonate	Yes	
Terry Bros ...	1st year	Mallee	Seeded with combined cultivator drill ...	Nabawa ...	3rd week April	35	60	Copper carbonate	Recleaned	
Atherton, A. ...	1st year	Mallee, jam and tea-tree	Seeded with combined cultivator drill ...	Nabawa ...	3rd week April	34	70	Copper carbonate	Yes	
Caunt, F. W. ...	1st year	Salmon and gimlet	Springtyne cultivated and cross seeded with combined cultivator drill	Gluyas Early...	1st week May	35	55	Copper carbonate	Yes	
Driver, A. ...	1st year	Salmon, gimlet, mallee and jam	Seeded with combined cultivator drill ...	Gluyas Early...	Last week April	32	60	Copper carbonate	No	
Macham, J. ...	1st year	Mallee and scrub ...	Seeded with a combined cultivator drill ...	Noongaar ...	Last week May	30	60	Copper carbonate	Yes	
Jackman & Wood	1st year	Salmon and gimlet	Seeded with combined cultivator drill ...	Gluyas Early...	1st week May	29	80	Copper carbonate	Yes	
Calder and Johnson	1st year	Salmon and gimlet ...	Seeded with combined cultivator drill ...	Gluyas Early...	Last week May	40	60	Copper carbonate	Yes	Ball Smut.
Sprigg, W. L.	1st year	Salmon, gimlet, tea-tree and jam	Ploughed with mouldboard 2½in deep during March; seeded with combined cultivator drill	Gluyas Early...	3rd week April	40	40	Copper carbonate	Yes	
Pollard & Naylor	1st year	Light mallee and scrub	Seeded with combined cultivator drill ...	Gluyas Early...	1st week May	30	60	Copper carbonate	Yes	Ball Smut

YILGARN PRIMARY PRODUCERS' ASSOCIATION.

Judge: G. L. THROSSELL, Dipl. Agric., Agricultural Adviser.

Seventeen crops were submitted for judging in this competition this year, three more than in the previous year, when two competitions were conducted—one for crops on fallowed land and the other on unfallowed land. This year, however, the competition was restricted to fallowed land only. It was surprising that so few entries were received from the Moorine Rock area, where interest in the competition was very keen last season.

The rainfall recorded at the different centres is as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
Turkey Hill ...	...	...	45	228	150	278	101	153	46	...	728	4	201	1,206
Southern Cross ...	...	200	89	275	106	267	92	121	50	8	644	16	...	1,224
Bullfinch	...	3	73	225	119	290	124	191	52	17	793	34	...	1,128
Corinthian ...	...	4	55	141	90	347	126	155	55	23	796	30	77	1,156
Moorine Rock ...	...	21	102	262	109	396	175	180	79	14	953	21	135	1,494

The winner was Mr. R. Teale, of Turkey Hill, whose crop of Nabawa was awarded 76 points. This was a tall and very even crop, portion of 100 acres, and was calculated to yield 32 bushels per acre. It was very free of weeds and disease (being the second crop), but contained a fair amount of admixture. The initial operation of fallowing was done with a combined cultivator drill in the previous July, and the fallow received two further workings with the same implement in August and November. The crop was planted at the end of April, 27 lbs. of graded seed and 57 lbs. of superphosphate being sown per acre.

The points awarded are shown in the following table:—

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Total. 100 points
Teale, R.	Turkey Hill	Nabawa ...	32	9	9	12	14	76
Worthing, F. J. ...	Southern Cross	Gluyas Early	29	8	8	13	14	72
Whann, T. J. ...	Moorine Rock	Nabawa ...	28	8	8	13	13	70
Cass-Smith, W. P.	Bullfinch ...	Gluyas Early	27	8	8	13	13	69
Davies, F. & J. ...	Corinthian ...	Nabawa ...	26	9	9	13	12	69
Brown, C. R. ...	Bullfinch ...	Gluyas Early	24	9	9	13	14	69
Copley, C. ...	do. ...	do. ...	26	7	9	13	13	68
Berry, T.	do. ...	do. ...	27	8	8	12	12	67
Davies, G. ...	Turkey Hill	Bald Early...	24	9	9	12	13	67
Davies, F. & J. ...	Corinthian ...	Gluyas Early	22	8	8	14	13	65
Lecky, J. V. S. ...	do. ...	do. ...	23	8	8	13	12	64
Godfrey, F. H. ...	Bullfinch ...	do. ...	20	9	8	13	13	63
Copley, T. N. ...	do. ...	do. ...	21	7	8	13	13	62
Cooke, W. ...	do. ...	Baroota Wonder Early	21	6	9	13	12	61
Dowdell, A. E. ...	Moorine Rock	Nabawa ...	18	7	8	13	12	58
Duncan, A. P. ...	Bullfinch ...	Gluyas Early	18	6	8	13	11	56
McKay, D. ...	Corinthian ...	do. ...	13	8	8	13	13	55

Several competitors planted the variety Gluyas Early too early, with the result that the crops were affected by Septoria and frost. This and similarly maturing varieties should not be sown before the beginning of May.

Wild Turnip (*Brassica tournefortii*) was noticed in crops around Bullfinch and Turkey Hill. This is a very serious weed, and it is only by the co-operative effort of everyone concerned that it can be kept in check. It is advisable not to seed too early fallows over which the turnip plants are known to have been blown. By delaying seeding and by sowing an early variety as late as is safe in the correct seeding period, the farmer has an opportunity of killing by cultivation the young plants which germinate after the early seeding rains. Plants found growing in the crop should be removed by either hoeing or hand pulling before they flower. As the seeds of plants belonging to this botanical family are known to remain dormant in the soil for many years, farmers were warned that it is not a weed which they can expect to eradicate in one year.

The cultural details of the competitors are summarised in the following table:—

CULTURAL DETAILS.

Competitor	No. years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.					lb.	lb.			
Teale, R. ...	2nd	Salmon gimlet and jam scrub	July	Combined cultivator drill	3	Good	Cultivated with combined cultviator drill August and November, planted with same implement	Nabawa	End April ...	27	57	Copper carbonate	Yes	
Worthing J.	3rd	Salmon gimlet and tea-tree	July	Disc ...	4	Good	Cultivated with combined cultviator drill Sept; disc harrowed Oct; drag harrowed and springtyne cultivated March. Planted with disc drill	Gluyas Early	2nd week May	25	95	Copper carbonate	Yes	Flag Smut.
Whann T. J.	3rd	Gimlet ...	July	Disc ...	3	Good	Springtyne cultivated end August. Planted with combined cultivator drill	Nabawa	End April ..	21	60	Copper carbonate.	Yes	Takeall
Cass-Smith, W. P.	3rd	Salmon gimlet and morrel	July	Disc ...	4	Good	Cultivated with combined cultivator drill Sept. and April. Harrowed Nov., planted with combined cultivator drill	Gluyas Early	1st week May	27	60	Copper carbonate.	Yes	Flag Smut
Davies, F & J.	1st	Salmon, gimlet and mallee	July	Disc ...	4	Good	Cultivated with combined cultivator drill Sept; planted with same implement	Nabawa	Mid April ...	34	80	Copper carbonate	Yes	
Brown C. R.	1st	Salmon gimlet, morrel and mallee	July	Disc ...	4	Good	Cultivated with combined cultivator drill Nov.; planted with same implement	Gluyas Early	Last week April	30	45	Copper carbonate	Yes	
Copley C. ...	4th	Salmon and gimlet	June	Disc ...	4	Good	Cultivated with combined cultivator drill Sept. Harrowed Nov. and cultivated March. Planted with combined cultivator drill	Gluyas Early	1st week May	30	80	...	...	
Berry, T. ...	3rd	Salmon gimlet and tea-tree	June	Disc ...	4	Fair	Planted with combined cultivator drill	Gluyas Early	1st week May...	25	65	Copper carbonate	Yes	Flag Smut

CULTURAL DETAILS.—*continued.*

Competitor.	No. years cropped.	Timber.	When ploughed	Implement.	Depth.	Condition of land.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
					in.					lb.	lb.			
Davies, G. ...	1st	Salmon gimlet, tea-tree and black butt	July	Springtyne cultivator	3-4	Good ...	Springtyne cultivated Sept. Planted with combined cultivator drill	Bald Early	Mid-April ...	30	80	Copper carbonate	Yes	
Davies, F. & J.	4th	Salmon and gimlet	July	Disc ...	4	Good ...	Springtyne cultivated Sept. and Nov.; planted with combined cultivator drill	Gluyas Early	Mid May ...	34	80	Copper carbonate	Yes	Flag Smut
Lecky, J. V. S.	2nd	Salmon and gimlet	July	Disc ...	3-4	Boggy ...	Springtyne cultivated Oct. and Nov.; planted with a combined cultivator drill	Gluyas Early	Mid May ...	50	60	Copper carbonate	Yes	Flag Smut
Godfrey, F. H.	1st	Gimlet, mallee and scrub	June	Disc ...	3	Good ...	Cultivated with combined cultivator drill Sept., harrowed Nov. Planted with combined cultivator drill	Gluyas Early	3rd week April	27	50	Copper carbonate	Yes	Flag Smut
Copley, T. N.	2nd	Salmon, gimlet, mallee and morrel	July	Disc ...	4	Good ...	Cultivated with combined cultivator drill Sept.; planted with same implement	Gluyas Early	3rd week April	27	80	...	...	Septoria
Cooke, W. ...	2nd	Salmon, gimlet, morrel and jam	July	Rigidtyne scarifier	3	Good ...	Springtyne cultivated October; planted with combined cultivator drill	Barooka Wonder Early	End April ...	25	70	Copper carbonate	...	
Dowdell, A. E.	3rd	Blackbutt, boree and mallee	June	Disc ...	4	Good ...	Reploughed and partowed August; planted with combined cultivator drill	Nabawa	Mid-April ...	27	60	Copper carbonate	Yes	Takeall and Septoria
Duncan, A. P.	4th	Salmon, gimlet, morrel, and mallee	June-July	Disc ...	3-4	Good ...	Cultivated with combined cultivator drill April; planted with same implement	Gluyas Early	Mid-May ...	30	60	Copper carbonate	...	Flag Smut
McKay, D. ...	3rd	Salmon and gimlet	Aug.	Disc ...	4	Good ...	Planted with a combined cultivator drill	Gluyas Early	Mid April ...	34	75	Copper carbonate	Yes	Septoria

BRUCE ROCK AGRICULTURAL SOCIETY.

Judge: G. L. THROSSELL, Dipl. Agric., Agricultural Adviser.

Six of the eight competitors in the 50-acre fallow competition submitted entries for the crop section of the follow and crop competition conducted by the Bruce Rock Agricultural Society. The awards were as follow:—

BRUCE ROCK AGRICULTURAL SOCIETY.

Judge: G. L. Throssell, Dipl. Agric., Agricultural Adviser.

Competitor.	District.	Variety.	Yield. 50 points	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points	Crop total Points. 100 points	Fallow total Points. 100 points	Total. Fallow and Crop. 200 points
Schilling, C. E. & N. S.	Bungulluping	Merredin	34	9	8	14	14	79	92	171
Farrall, F. C., & Sons	Yarding	Gluclub	35	9	8	12	13	77	89	166
Leah & Son...	do. ...	do. ...	35	8	7	12	13	75	89	164
Buller & Black	Babakin	Free Gallipoli	30	8	8	14	12	72	91	163
Strange, P. A.	Yarding	Gluclub	31	8	8	12	12	71	90	161
Brown, S. A.	Bungulluping	S.H.J. ...	24	7	7	13	12	63	89	152
Farrall, F. C., & Sons	Yarding	...	...	Stripped	...	...	...	...	90	...
Smith Bros....	Central Kummininn	...	...	Withdrew	...	...	...	...	90	...

Messrs. C. E. and N. S. Schilling, of Bungulluping, won the combined competition with an aggregate of 171 points out of a total of 200 points. The crop submitted for inspection was of the variety Merredin, and excepting for the presence of a little Flag Smut this entry scored well in every section, being very free of weeds and admixture. The fallow on which this crop was sown won the fallow section of the competition and received the following working:—It was ploughed in June with a disc implement to a depth of 3-4 inches, received a further working with the same implement during the end of July and early August, and was cultivated with a combined cultivator-drill after rain in November and prior to seeding, which took place during the second and third week in May. Seed was sown at the rate of 60 lbs. and superphosphate 80 lbs. per acre respectively.

Competitors with the variety Gluclub lost points for admixture, it being very noticeable this year that this variety is showing considerable variation and the need for attention in this direction.

The rainfall for the various centres in the district was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Bruce Rock ...	...	...	216	192	64	342	254	194	107	26	987	...	49	1,444
Yarding	...	9	209	134	72	380	252	194	124	31	1,053	...	15	1,420
Central Kummiuin..	...	9	137	162	79	367	303	136	133	29	1,047	9	35	1,399
Babakin	...	3	214	154	57	341	330	149	126	23	1,026	...	70	1,467

The cultural details of the competitors are summarised in the following table:

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Implement	Depth.	Condition of land	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super	Seed Treatment.	Graded.	Disease.
					in.					lb.	lb			
Schilling, C.E., & N. S.	...	Salmon and gimlet	June	Disc	3-4	Good	Replonghed with disc July-Aug.; cultivated with combined cultivator drill Nov.; springtyne cultivated mid-May. Planted with combined cultivator drill	Merredin	2nd and 3rd weeks May	60	80	Copper carbonate	Yes	Flag Smut
Farrall, F. C., & Sons	9	Salmon gimlet and morrel	June	Mould-board	4	Good	Portion springtyne cultivated June, balance worked with disc Aug., rigid tyne scarified Sept., springtyne cultivated Sept., Nov., and April. Planted with combined cultivator drill	Gluclub	Last week April	48	108	Copper carbonate	Yes	Flag Smut, Takeall
Leah and Son	8	Salmon, gimlet and morrel	June	Mould-board	3	Good	Cultivated with combined cultivator drill July, Aug., Oct.; rigid tyne scarified May. Planted with combined cultivator drill	Gluclub	Mid-May ...	50	90	Copper carbonate	Yes	Takeall, Flag Smut and Bunt
Butler & Black	...	Salmon, gimlet, jam & yorkgum	June July	Disc	3	Good	Harrowed July, rigid tyne scarified Aug., Oct., Mch. and prior to seeding; planted with disc drill	Free Gallipoli	1st week May	52	120	Copper carbonate	Yes	Takeall and Flag Smut
Strange, P. A.	7	Jam, yorkgum and wattle	July-Aug.	Mould-board	3-4	Good	Springtyne cultivated Sept., Mar. and April; planted with combined cultivator drill	Gluclub	1st week May ...	55	103	Copper carbonate	Yes	Flag Smut and Septoria
Brown, S. A.	5	Salmon gimlet and mallee	July	Rigid tyne scarifier	3	Good	Cultivated with disc in Sept., rigid tyne scarified Nov. and prior to seeding; planted with combined cultivator drill	S.H.J.	Mid-May ...	50	94	Copper carbonate	Yes	Takeall

THE APPLE CURCULIO.

(H. G. Andrewartha, B.Sc. in Agric., Entomology Branch.)

This weevil (*Otiorrhynchus cribricollis*) was described by Gyllenhall from specimens collected in Southern France as far back as 1834. It is a native of the Mediterranean regions of France and Italy, where it feeds upon various species of Medicago, including Lucerne (*Medicago sativa*). It has been recorded feeding upon Olives and other cultivated plants in Algeria. Two years ago the first record of its appearance in California was made, where it apparently feeds upon ornamental trees and shrubs. In 1906 the Curculio was first mentioned in Australian literature by Quinn in the Journal of Agriculture for South Australia. Since then it has been recorded as damaging almost every variety of fruit tree that is grown there. The exact date of its importation into this State cannot be ascertained, but there is no doubt that it has been in the Bridgetown district for 30 years, and probably much longer. This weevil has been spreading in recent years, until now there are records of its having appeared in the following widely separated districts—Bridgetown, Balingup, Donnybrook, Karragullen, Mount Barker, Katanning, Narrogin and Kalgoorlie.

DESCRIPTION AND LIFE HISTORY.

When first laid the eggs are a pearly white, but within a few days they become a lustrous sooty black. They are oval in shape, and are 1 32-inch long by 1/40-inch wide. They are probably laid promiscuously on or under the surface of the soil throughout the orchard. Egg-laying commences about the middle of March, reaches its maximum about three to five weeks later, and then dwindles until the last few are laid late in May or early in June. Each weevil lays about 55 eggs. About three weeks after the rain sets in the first of these hatch: the last larvae to emerge from the eggs do so some time late in July.

The newly emerged larva is a minute legless grub about 1/20-inch long. It is white except for the head, which is a brownish yellow. The widest part of the larva occurs just behind the head, from which point it tapers posteriorly. The first consideration of this tiny grub is to burrow into the soil, where it searches out a root of one of the many weeds which are germinating in the orchard at this time. The larvae feed throughout the winter, but only grow slowly until about August. From August on to early November growth is very rapid. The mature larva is about half an inch long, shaped and coloured much the same as the newly hatched grub. When dug up from the ground they curve themselves in the shape of a crescent. They occur throughout the orchard between about 3 inches and 15 inches below the surface.

The pupa is white, slightly less than half an inch long, and provided with the developing legs, antennae and wing cases of the adult which are all plastered down outside the body. It is invariably found in a small earthen cell, which is excavated by the larva before pupating. The first larvae begin to pupate about the third week in October, but the majority of them do not pupate until about the first week in November. The pupae all occur between 9 inches and 12 inches below the surface. The pupal stage lasts for about three weeks.

Late in November and early in December the adults emerge and commence feeding. They are a typical weevil, with their head produced forward into a snout and their antennae elbowed. They are slightly more than 1/4-inch long, and of a

uniform reddish brown or brownish black colour. The head and thorax are uniformly pitted, as are the elytra or wing covers which, in addition, are provided with a dusting of very fine whitish scales and a number of fine whitish hairs. They have no wings, and hence cannot fly. Their tarsi are provided both with claws and pads to assist them in climbing.

Plate I.

(1) Fully grown larva × 6.

(2) Adult weevil × 6.

Inset: Newly hatched larva and the egg from which it has emerged × 6.

They feed without laying any eggs for about six weeks after their emergence. Early in January they become inactive, and cease feeding. About 20th February they commence feeding again, and continue late into the autumn, when most of them die. The first eggs are laid about the middle of March, and the last early in June.

The above is a brief description of the complete life cycle from egg to adult and death of this curculio, but some individuals vary this routine. Variations occur both in the larval and adult stages. Some larvae are much slower than normal in their development, with the result that they are less than half-grown when the summer sets in. These burrow down two or three feet and aestivate. Throughout the long summer they remain in earthen cells in the damp subsoil, neither feeding nor growing. When the winter rains set in they recommence feeding, gradually working their way towards the surface to pupate and emerge amongst the earliest of the December swarm. So far as can be gathered, about 12 per cent. of the total larvae aestivate each year.

Although most of the adults die in the autumn after having lived for about five months, about 14 per cent. live on right through the winter, feeding very little until about the end of September, when they start feeding regularly and lay about two eggs each. They cease feeding again about mid-November, start again about mid-December, and feed until about 15th January, when they join the new season's brood in their mid-summer spell. These weevils feed again about 20th February, lay the remainder of their eggs, and die later in the autumn.

Plate II.

Apple leaves showing typical curculio damage. Note the serrating of the edges and the holes.

NATURE AND EXTENT OF THE INJURY.

The only time in which the weevil does any damage is in the adult stage. The larvae feed upon the finer roots of the weeds in the orchard and only occasionally eat the apple roots, but the adults when numerous, as they often are, do very serious damage. When they first start feeding in December, they confine their attentions to the edges of the leaves, though they sometimes eat holes in them. For about a fortnight before they become inactive, however, they have a tendency to nibble the stems of the apples and the leaves, and often cut these right off. It is quite a common sight at this time of the year to see an orchard which is badly in-

fested with curculio thick with fallen leaves. When they start feeding again in the autumn, they eat the leaves, but in addition, there is a big tendency to ring-bark the buds and spurs, and also the stems of the apples. This is when the most serious damage is done, as the weevil invariably attacks the weak and sickly limbs

Plate III.

A Jonathan showing severe weevil injury. Note how the weak side has been attacked.

and can often, as the result of their bark-eating habits, kill these right out, or at least prevent them from growing. In this way a tree which happens to be weak in one side becomes even more so.

GENERAL HABITS OF THE ADULTS.

These weevils are night feeders. During the day they lie concealed beneath the soil about three inches below the surface. With the approach of night they emerge from their shelter, climb up the trees and feed until the morning, when they climb down and again seek shelter. Calm dewy nights are most favoured for feeding. Not all the weevils are feeding every night. They do not all climb the tree nearest to them, but many wander off to other trees. This wandering tendency is accentuated if a tree is rendered difficult to climb by having a band placed around its trunk. The majority of the weevils do not go far from the tree when they climb down in the morning, but bury themselves within a few inches of the butt. The soil around a typical tree was examined to a depth of nine inches in nine-inch strips away from the trunk, with the results shown in the following table:—

	No.	Per cent. of total.
First—nine inches	396	61.7
Second—nine inches	180	28.0
Third—nine inches	64	9.9
Fourth—nine inches	3	0.4

CONTROL MEASURES.

During the investigation of this pest the author has seen many different methods of control, but most of them have serious drawbacks. Many do not give a complete enough control while others although effective, are costly in labour or materials. Methods of control can best be discussed under seven headings:

1.—Cultural Methods.

The only way ways in which methods of cultivation can be used to assist soil inhabiting insects are unfortunately unfortunately with comparatively few results. It is not possible to starve the larvae out by maintaining a clean fallow in the orchard, as the moths throughout the winter are essential, and even if it were possible to keep them down for one winter, the larvae would very probably feed

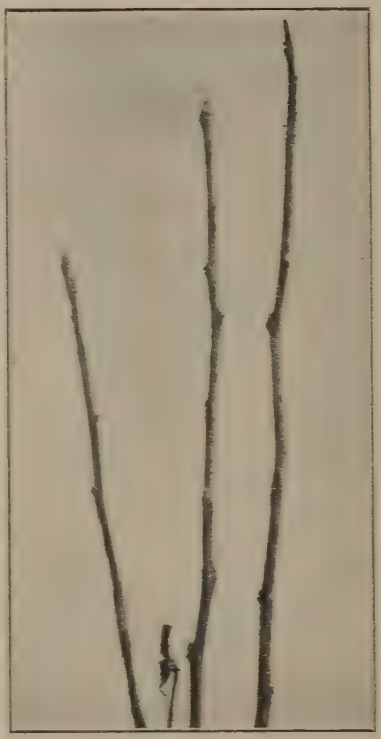


Plate IV.

Apple twigs showing the ringbarking which is typical of the damage done during the autumn feeding period.

upon the apple roots. The other method sometimes employed against soil insects is to skimmer during the pupal stage. With the apple codlin, pupation does not occur until early in November, and by this time the orchard has already been ploughed twice and probably cultivated. The ploughing destroys the larvae and turns many thousands of them up, but unfortunately it kills very few; they merely

burrow down again below the level of the ploughing, so that subsequent ploughing and cultivating does not reach them either while they are still larvae or after they have pupated. Were it possible to postpone the first ploughing until early in November the majority of the larvae would have pupated between six inches and nine inches below the surface, and most of them would be destroyed by the plough, but as it is not possible to postpone the first ploughing to this date, cultural methods offer no means of controlling this pest.

2.—*Biological control.*

Although this weevil is not regarded as a serious pest in its native home, as far as our investigations have gone, this seems to be the result of climatic and other conditions rather than due to the presence of parasites.

3.—*Banding methods.*

The object of this method is to prevent the weevils from climbing the trees, and thus to starve them out. Many different types of band have been suggested. In order to test them out under equal conditions, an experiment was conducted at Mr. Hester's property, Bella Vista, Bridgetown. A block of trees, six trees square, was divided up into four blocks of nine trees each. The central tree in each block was left untreated for a control, and the trees around it were banded alternately with full wooded merino sheepskin bands, metal bands, and Ostico bands. The wool was washed in warm, soapy water, cut into strips about one inch in diameter and tacked around the trunks of the trees with the wool innermost, in such a way as to leave about two inches of wool protruding beyond the edge of the skin. The metal bands were made of galvanised flat iron, as described by Flintoff in this Journal for June, 1929, page 333. The trees on which these were placed were first banded with a narrow piece of sacking; the band was then put in position and pulled up as tight as it would go, any cracks due to the irregularities in the trunks being packed with wool.

Ostico is a sticky tree-banding material which is sold by the Westralian Farmers, Ltd., and was used in these experiments as being typical of a number of similar tree-banding preparations on the market. It was smeared on grease-proof paper, which was then tied to the trunk with string.

Above all the bands was placed a fairly wide band of sacking, whose purpose was to induce those weevils which did succeed in crossing the band to camp there on their way down in the mornings. The four control trees had similar sacking traps, but no preventive bands.

The experiment was initiated on 23-10-30. When it was examined on 14-11-30 it was found that some of the over-wintering weevils had succeeded in crossing the bands on some trees, as shown in the following table:—

No. of tree.	Treatment	No. weevils.
4	wool band	6
8	control	3
11	control	6
17	wool	1
20	wool	1
25	wool	3
26	control	8
27	wool	1
28	Ostico	1
29	control	8
30	wool	4

The trees which do not figure in the table had no weevils above the bands.

When the experiment was next examined on 2-12-30 the new season's weevils had crossed every type of band in hundreds, and were doing a very considerable amount of damage to all the trees. It is thus very evident that the three types of band used in this experiment were failures. Doubtless, they offered some resistance to the weevils, but certainly not enough to make them worthy of consideration.

These bands were all put on about two months before cultivation ceased in the orchard, and although this could not have affected either the wool or metal bands, it was thought that possibly the failure of the Ostico was due to its becoming coated with dust from the cultivating. Consequently, some further experiments were planned with it. Eight trees were treated in Mr. Martin's orchard at Queenwood on 5-12-30. The Ostico was placed on grease-proof paper and on metal bands. In the former case a piece of cotton wool was tied around the trunk. The Ostico was spread on grease-proof paper, which was then tied over the cotton-wool. The metal bands were put on as described above, and the Ostico painted on to the band. The details of the treatments and the number of weevils getting over nightly are shown in the following table:—

No. of Trees.	Treatment.	No. of Weevils getting over in specified nights after treatment.										Total.
		1st.	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1	Ostico on metal	5	5	...	4	1	...	5	2	3	...	25
2	,, paper	...	14	7	3	3	7	2	8	2	8	54
3	,, paper	...	5	1	10	...	1	12	...	8	1	38
4	,, paper	71	...	4	0	...	24	0	...	...	12	111
5	,, paper	...	...	0	1	...	...	2	...	...	...	3
6	,, metal	5	3	2	1	...	2	2	1	...	...	16
7	,, paper	21	10	2	10	4	2	15	2	32	1	99
8	,, metal	14	34	14	11	10	14	13	5	113	18	246

Four control trees alongside averaged about fifty weevils per night, or a total of 500. It is thus evident that the bands stopped or drove away about 85 per cent. of the weevils present. This is a fairly good result, but nevertheless, this method has one very serious drawback. There are pieces of grass straw constantly blowing about the orchard, and it only needs one of these to land on the band for it to form a bridge, over which the weevils pass very readily. This, combined with the dust, tend to prevent the Ostico from remaining a very efficient barrier for more than a couple of weeks at a time, and hence this method cannot be recommended as an economic means of control of the curculio.

4.—*Soil fumigation methods.*

These methods depend upon the habit which the weevil has of burying itself close to the butt of the tree during the daytime. Some soil fumigant, such as Cyanogas (Calcium cyanide), is placed under the soil around the trunk of the tree in the day time, or alternatively on the surface of the soil as the weevils are about to ascend the tree. Either method would probably be moderately successful if all the weevils ascended the tree to feed every night, but unfortunately some are wandering over the orchard and others lying quietly beneath the soil on every night. Consequently, before these methods can be successful they must be repeated several times, so often in fact, as to render them uneconomical.

6.—*Trapping methods.*

The following is a description of the methods used very successfully by Mr. Keall, of Queenwood, in controlling this pest. He places a sticking trap, [illegible] about nine inches wide around the butt of the trees. The weevils congregate under this, and he goes around daily, or every few days, destroying them either by allowing fowls which are running in the orchard to eat them, or by collecting and killing them in a tin containing oil. Practised assiduously over two years, this method has proved very effective, as the numbers on his orchard have been reduced from many thousands per tree to less than one hundred per tree. However, even though this method has been successful in controlling the weevils, it has proved very expensive in labour, and for that reason can hardly be recommended as an economical means of control.

6.—*Poultry.*

It has been demonstrated in a number of orchards that fowls are particularly fond of the apple curculio. Consequently it is possible by systematically penning them in the orchard to obtain a very good control of the weevil. If this method is to be used, arrangements should be made to place about 100 half-grown White Leghorn fowls in every acre of infested orchard each year about the beginning of December. To make a success of this method it is necessary to build easy-roof coops for the birds in the orchard, and to water and feed them there. The fowls can either be reared on the premises, as does Mr. Johnston of "The Cascades," Greenbushes, or they may be purchased annually. About this time the poultry farmers always have numerous culled cockerels about eight weeks old for sale at very cheap rates.

There is much diversity of opinion among growers as to whether or not this method is practicable and worth the trouble, labour and expense involved, but there is little doubt that if it is properly and systematically carried out, it gives very good control of the weevil.

7.—*Poisoning.*

This is probably the most practicable method of all. The poison can be applied either as a spray or as a bait. The important point to watch is the time of application. If one refers back to the description of the life history given above, it becomes apparent that the vulnerable period in the life of this pest is during its December feeding. During the six weeks between 25th November and 5th January every weevil of both the over-wintering and new season broods are feeding, but they do not reach sexual maturity, i.e., no eggs are laid, until after their mid-summer period of inactivity. Hence it is obvious that any campaign against them should be launched at this time in order to kill them before they can lay their eggs.

For this end, spraying with arsenate of lead at the rate of 1 lb. of paste to 8 gallons of water is recommended for young trees, or trees not bearing fruit. The time of application should be the first week in December. If the trees are growing rapidly, it may be necessary to repeat the spray about 10 days later. Unfortunately this method cannot be employed where the trees are bearing a crop as the strength used is well outside the limit of safety laid down by the regulations of the Department of Public Health.

For trees bearing fruit a bait has been evolved during the progress of this investigation which, although not thoroughly tested yet, has given very excellent results so far. This bait is made by mixing 9 lbs. of ground dried apple with 1 lb. of powdered sodium fluoride or arsenate of lead. The former has a quicker poison-

ing effect upon the weevil, but is must less dangerous to humans than the latter. It should be applied about the first week in December, or the last week in November. A narrow strip of the bait should be placed around and close to the butt of each tree. It is necessary to watch that a complete ring of bait is used so that no weevils can ascend the tree without first coming in contact with the bait. They are so keen on the dried apple that very few will climb the tree in preference to eating the bait on the ground. The advantage of the apple is that it is hygroscopic, *i.e.*, it takes up moisture from the air and remains moist and palatable for weeks after it is applied. For this reason it is not necessary to repeat the application unless heavy rains occur after it has been laid. It is estimated that 10 lbs. of bait will do from $^3/_4$-1 acre of orchard. As it will require 5 lbs. of green apples to make 1 lb. of the dried material, it will be necessary to dry 50 lbs. of fresh apples for each acre of orchard to be baited.

In order to make the drying a "spare time" job, it will be necessary either to dry the "rejects" after the rush of picking and packing is over, or else to dry the windfalls before the such period begins. Once dried, the apples should be minced or ground up and mixed at the rate of 9 lbs. to every 1 lb. of sodium fluoride. Care should be taken to incorporate the poison evenly throughout the apple. Once mixed, the bait may be stored in tins or other suitable containers until it is required in the first week in December.

The price of sodium fluoride in Perth is 2s. 2d. per lb. As 1 lb. of poison is sufficient for one acre of orchard, the price for three is slightly under ¼d. The windfall or reject apples cost nothing. If the drying and mixing of the bait is made a spare-time job, the cost of the labour in making the bait would be very small. Further, the labour involved in applying it is very much less than in any of the other methods of control. Hence, this method scores both in the cheapness of the materials and low cost of application.

SUMMARY.

Otiorhynchus cribricollis was introduced into Western Australia more than 30 years ago, since when it has spread alarmingly.

The normal life cycle occupies one year, but some individuals vary from normal: some larvae aestivate through the summer and some adults hibernate through the winter.

The adults feed in two periods, the first in the early summer and the second in the autumn.

The nature of the damage varies a little with the period of the year.

The eggs are laid in the autumn, between 15th March and early June.

In controlling the pest it is essential to attack it before sexual maturity is reached, *i.e.*, during the first period of feeding—November, December.

Control measures recommended are:—

(a) For young trees or trees not bearing fruit, spraying with arsenate of lead at the rate of 1 lb. of paste to 8 gallons of water (or 1 lb. of powder to 16 gallons) applied the first week in December and repeated ten days later if necessary, owing to rapid growth of the trees.

(b) Baiting with the following mixture: —ground dried apple 9 lbs., sodium fluoride 1 lb., for all trees whether bearing fruit or not.

(c) Running poultry in the orchard.

SEED TESTING FOR FARMERS, SEED MERCHANTS, ETC.

Farmers and others interested are advised that seed samples will be tested for purity and germination by the officers of the Plant Pathology Branch of the Department of Agriculture, at the following statutory charges (Agricultural Seeds Act, 1923):—

	s.	d.
Purity only	5	0
Germination only	2	6
Complete test (purity and germination) ..	6	0

SIZE OF SAMPLES AND METHOD OF SAMPLING.

Samples submitted for testing must be taken in such a way as to represent as accurately as possible the whole bulk. Thus equal amounts should be taken from each container, and from the same respective places in containers.

The following are the minimum samples necessary for obtaining the "bulk sample":—

1-5 *bags.*—Take equal samples from top, middle, and bottom of each bag.

6-50 *bags.*—Sample every fifth bag, with a minimum of five.

50 *bags upwards.*—Sample every tenth bag, with a minimum of ten.

Bins, cars, etc.—Sample by a long trier, or probe, in several places in each container.

Packet Seeds.—Select entire packets for test.

The total quantity of seed obtained, as above, will be in excess of that required to be sent to the Department of Agriculture for testing, so it should be thoroughly mixed prior to division, and a representative portion of the "bulk sample" sent for examination.

The following are the *minimum* weights of samples which should be submitted for testing:—

(a) Wheat, oats, barley, rye, maize, peas, beans, cowpeas, soybeans, or seeds of size similar to any of these—1 lb.

(b) Vetches, tares, rice, sorghums, sudan grass, linseed, rape, buckwheat, cotton, subterranean clover, or seeds of size similar to any of these —8 ounces.

(c) Lucerne, canary grass, prairie grass, millet, rye grasses, clovers not enumerated elsewhere, birdsfoot-trefoils, melilots, medics, trefoils, or seeds similar in size to any of these—4 ounces.

(d) Grasses other than those already mentioned, and all other seeds not already allowed for—2 ounces.

INFORMATION PROVIDED BY THE SEED CERTIFICATE.

The Seed Certificate, issued for each sample of seed submitted for testing, provides, among other things, the following information:—

(a) The percentage by weight of *"pure seeds" (i.e.,* the outwardly-sound seeds (only) of the kind submitted for testing).

(b) The percentage by weight of *weed seeds.*

(c) The percentage by weight of *other crop seeds.*

(d) The percentage by weight of *inert matter* (rubbish, sticks, broken seeds, stones, etc.).

(e) The *percentage germination,* by number, of the "pure seeds."

(f) The percentage, by number, of *"hard seeds"* (if any).

(g) The percentage by number of *dead* seeds.

(h) The percentage, by number, of *seeds which germinate but do not give a seedling capable of establishing itself.*

(i) The percentage, by number, and identity of *noxious weed seeds* (if any) in the sample, and also the number calculated to one pound of sample.

(j) The percentage, by number, and identity of *other weed seeds* in the sample, and also the number calculated to one pound of sample.

(k) The percentage, by number, and identity of *other crop seeds* in the sample, and also the number calculated to one pound of sample.

(l) The nature of the *inert matter* present (sticks, stones, broken seeds, empty husks, etc.).

(m) The *"Actual Value"* or *"Purity Value"* percentage of the sample (*i.e.*, the percentage by weight of the sample which consists of pure germinable seeds).

(n) Any other remarks which may be considered of interest.

Samples for testing, accompanied by the Statutory Fee, as indicated above, should be addressed to the—

Plant Pathologist,
Department of Agriculture,
St. George's Terrace,
Perth.

FIELD EXPERIMENTS WITH WHEAT AND OATS, 1930.

MERREDIN EXPERIMENT FARM.

I. THOMAS, Superintendent of Wheat Farms.
and
J. H. LANGFIELD, Farm Manager.

The total rainfall for the year ending 31 12 30 was 13.33 inches, and during the growing period 8.23 inches. The following table shows the monthly rainfall together with the average over a period of 19 years:—

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1930	...	1	281	186	40	363	137	184	65	34	823	1	41	1 333
Average, 19 years ...	55	56	125	79	130	195	188	140	93	75	821	44	54	1,234

The season opened with splendid rains during March and April, 4.67 inches being recorded; this was responsible for giving the weeds a good start before seeding commenced. May was a dry month, and lent itself admirably for killing the weeds: it was also responsible for allowing the seeding to proceed uninterrupted. Owing to the growth of weeds on the fallow it was necessary to cultivate several times in order to kill them. This was responsible for the loss of moisture in the surface soil, and delayed the germination of the May plantings until after rain, which fell on June 1st.

The season progressed very satisfactorily until September, when the rainfall was again very light, only 65 points being registered in that month in eight falls, the heaviest of which was 16 points. October was also dry (34 points only being recorded).

The land on which the experiments were planted originally carried a forest of salmon gum and gimlet, and the soil is typical of that class of country. The farm is worked on a three year rotation, namely fallow, crops (mainly wheat and oats) and pasture.

The experimental block received uniform treatment, being ploughed with a heavy disc plough to a depth of 4in. in June, 1929, reploughed in August and springtyne cultivated in March, after rain. Excepting where otherwise stated, or where the requirements of an experiment necessitated a modification of the treatment, the fallow was given a further cultivation with a springtyne cultivator prior to seeding.

TIME OF SEEDING EXPERIMENT.

This experiment has been conducted for the past eight years with Gluyas Early planted mid-May, June and July, and for two years with the mid-season variety Nabawa, planted mid-April, May and June.

In addition to the general cultural operations outlined the May, June and July plots were cultivated prior to seeding the May plots: the June and July again in June and the July plots again before seeding.

The plots sown in April made a good even germination, but owing to very dry conditions during May made very slow growth. The May sown plots did not germinate until after rain fell on June 1st, making them two weeks late.

The results obtained this year, together with the average results of past years, are as under:—

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Superphosphate—150lb. per acre. Seed—45lb. per acre.

Planted.	Computed Yield per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
April 17	34 16	33 28	34 8	33 52	34 24	34 2	120	28 15	112
May 15	28 48	28 40	27 52	26 24	29 36	28 16	100	25 19	100
June 16	14 48	16 40	12 32	16 0	20 0	16 0	57	14 59	59

Variety—Gluyas Early. Superphosphate—150lb. per acre. Seed—45lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1923–30.	Percentage Yields, 1923–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
June 16th	26 16	28 48	29 52	27 20	28 48	28 13	83	21 34	83
May 17th	34 0	34 8	33 36	35 12	34 0	34 11	100	26 2	100
July 14th	14 0	14 0	11 12	15 4	13 4	13 28	39	12 20	48

The results obtained with both varieties confirm those of previous years, the conclusion being that it is inadvisable to extend the planting period to the month of June. If it is not possible to complete the seeding during the month of May, it is better to plant a suitable midseason variety in April.

RATE OF SEEDING EXPERIMENT.

As in previous years this experiment was carried out with two varieties, viz., Nabawa, representing the free stooling varieties, and Noongaar, representing the sparse stooling varieties.

In addition to the general working outlined, the land was given a springtyne cultivation prior to seeding the Nabawa, and then harrowed. The Noongaar plots were disc cultivated before seeding.

Germination was patchy, some of the patches not showing up until after rain on June 1st.

The results are as under:—

RATE OF SEEDING EXPERIMENT.

Planted on 26th April, 1930. Variety—Nabawa. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1913–30.	Percentage Yields, 1913–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb.	34 40	33 36	33 12	30 8	31 12	32 34	95	19 24	95
45lb.	35 36	33 52	34 24	32 48	33 52	34 6	100	20 28	100
60lb.	34 24	34 16	34 24	33 52	33 4	34 0	100	20 33	100

Planted on 27th May, 1930. Variety—Noongaar. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1923–30.	Percentage Yields, 1923–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb	32 56	28 16	25 44	25 44	24 16	27 23	98	18 10	97
45lb.	32 56	27 44	27 36	25 4	26 24	27 57	100	18 40	100
60lb.	32 0	28 32	27 4	25 12	26 56	27 57	100	18 18	98

The results obtained at this farm show that it is unnecessary to sow either the sparse or the free stooling varieties at a rate higher than 45 lbs. per acre.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

The object of this experiment is to determine whether, when heavy dressings of superphosphate are applied, it would be profitable to apply part or whole of the amount when cultivating the fallowed land during late summer or early autumn.

Before seeding the land was disced and cross-disced with a tandem disc and harrowed after seeding. Owing to the absence of rain the seed did not germinate until after rain on 1st June.

The layout of the experiment and the results obtained are given below:—

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 12th May, 1930. Variety—Gluyas Early. Seed—45lb. per acre.

Time of Application of Superpho-phate.	Computed Yields per Acre.										Average Yields per acre, 1930.	Per-centage Yields, 1930.	Average Yields per acre, 1928–30.	Per-centage Yields, 1928–30.
	Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	bus.	lb.	%
75lb. super. in March : 150lb. at Seeding ...	28	56	25	36	27	28	31	20	28	16	28	19	103	24	25	106
225lb. in March ...	29	4	26	32	26	40	28	24	27	20	27	36	100	23	2	100
150lb. in March : 75lb. at Seeding	28	40	29	52	32	48	31	20	32	0	30	56	112	24	50	108

The results this year confirm, but to a lesser extent, those of the previous year, indicating, as they do, that the yields of the wheat crop are decreased when portion of the fertiliser is not applied at seeding time.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

In 1929 it was decided to enlarge this experiment so as to ascertain in what proportion a greater rate of superphosphate, up to 300 lbs., would affect the yield, although it was not anticipated that it would be profitable to apply that quantity. It was also decided to include a zero plot having no superphosphate.

In order to preserve the three-plot system this experiment was divided into two sections, in each of which plots treated with 150 lbs. of superphosphate per acre were regarded as controls. Thus in section 1, the rates of 300 lbs. and 225 lbs. per acre were compared with the control rate of 150 lbs. per acre, and in section 2 the rates of no superphosphate and 75 lbs. were compared with the control rate.

From the yields on the plots where no superphosphate was applied, it is evident that the crop is benefiting from the residual effects of previous dressings, but as this plot falls on the same place each year, any residue in the soil should eventually become exhausted.

The land was disced and cross-disced with tandem disc prior to seeding and harrowed after. Germination did not take place until after rain on June 1st.

The results obtained are shown hereunder:—

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT, No. 1.

Planted 12th May, 1930. Variety—Gluyas Early. Seed—45lb. per acre.

Treatment.	Computed Yields per Acre.										Average Yields per acre, 1930.	Per-centage Yields, 1930.	Average Yields per acre, 1929–30.	Per-centage Yields, 1929–30.
	Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	bus.	lb.	%
300lb. super. per acre	30	8	31	52	31	44	32	8	27	44	30	43	113	28	8	107
150lb. super per acre	30	24	29	4	27	20	24	32	24	40	27	12	100	26	15	100
225lb. super per acre	30	24	31	26	31	4	27	44	27	28	29	59	109	27	32	105

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT, NO. 2.

Planted 12th May, 1930. Variety—Gluyas Early. Seed—45lb. per acre.

Rate of Application of superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
No Super.	13 4	12 40	13 20	10 24	15 12	12 56	46	16 29	60
150lb.	23 44	27 36	28 0	30 24	30 56	28 8	100	27 41	100
75lb.	24 56	22 48	25 44	26 32	26 8	25 14	90	25 10	91

These results indicate that for this class of country, and with wheat at its present price, it is profitable to apply superphosphate up to about 112 lbs. per acre.

SEASONAL PLANTING EXPERIMENT.

The objects of this experiment are:—

1. To ascertain the most suitable month to plant the Late, Midseason and Early maturing varieties of wheat.
2. To determine the most prolific of each of the three types.

To meet the requirements of this experiment, three sections were needed, viz.:

(a) Section 1, planted in April, representing Early planting.
(b) Section 2, planted in May, representing Midseason planting.
(c) Section 3, planted in June, representing Late planting.

The arrangement of the experiment was similar to that of last year, the control plots, of the variety Nabawa, all being planted in the respective months of the three sections. In addition to the cultivations already outlined, the land was spring-tyne cultivated prior to seeding and harrowed after.

The tabulated results are shown hereunder:—

SEASONAL PLANTING EXPERIMENT.

April Planting.

Planted on 16th April. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Date Planted.	Computed Yield per Acre.					Average Yield per acre, 1930.	Average percentage Yield per acre, 1930.	Average percentage Yield per acre, 1928–30.
			Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
			bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King	Late ...	17–4–30	28 56	27 12	23 12	29 12	27 36	27 14	92	76
Nabawa ...	Midseason	,,	31 20	30 40	30 0	28 56	27 4	29 36	100	100
Bencubbin ...	do. ...	,,	33 36	32 16	28 56	34 8	31 52	32 10	109	110*
M.14 (Nabawa x Bunyip)	Very early	,,	19 12	17 36	17 4	21 12	21 4	19 14	68	...
Nabawa ...	Midseason	,,	28 8	27 4	28 16	29 20	27 44	28 6	100	100
Gluyas Early	Early ...	23–4–30	24 40	25 44	27 4	27 4	25 52	26 5	87	86
Carrabin ...	Early ...	,,	22 56	25 44	28 40	32 0	32 24	28 21	94	90
Nabawa ...	Midseason	,,	27 4	28 0	30 0	33 36	31 52	30 6	100	100
M.20 (Nabawa x Gluyas Early	Early ...	,,	26 16	27 20	29 20	31 36	32 8	29 20	97	...

* Average 2 years, 1929–30.

May Planting.

Planted 16th May. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields per acre, 1930.	Percentage Yields per acre, 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
[illegible]	[illegible]	24 24	24 32	21 20	20 0	19 36	21 58	74	71
[illegible]	Midseason	32 0	32 56	30 8	28 8	25 28	29 36	100	100
[illegible]	Midseason	36 8	36 4	34 40	32 8	27 36	33 7	112	112
[illegible] Early	Early	29 4	29 32	28 8	26 56	25 12	27 50	100	*
[illegible]	Midseason	33 44	33 4	28 32	26 0	24 24	27 57	100	100
[illegible]	Early	31 32	31 44	30 16	31 12	24 24	29 46	106	101
[illegible]	Early	30 40	30 36	30 40	30 48	27 12	30 2	107	108
[illegible]	Midseason	29 28	29 44	29 56	26 24	28 16	28 11	100	100
[illegible]	Early	28 24	29 16	28 16	28 24	25 20	28 8	100	107
M. 20 (Nabawa x Gluyas Early)	Early	30 32	30 20	28 48	30 8	24 32	29 1	107	*
[illegible]	Midseason	29 32	29 20	26 40	28 0	22 8	27 12	100	100
[illegible]	Early	29 36	29 4	29 8	25 20	19 28	24 27	90	93
[illegible]	Very Early	25 4	24 56	25 28	25 4	19 28	24 0	87	95
[illegible]	Midseason	32 8	29 28	24 56	29 44	22 32	27 39	100	100
[illegible]	Very Early	34 32	32 16	29 56	32 8	26 24	31 7	113	111

* Planted 1930 only.

June Planting.

Planted 17th June. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields per acre, 1930.	Percentage Yields* per acre, 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Benubbin ...	Midseason ...	27 36	27 4	29 12	26 8	26 16	27 15	122	*
Nabawa ...	Midseason ...	20 40	21 28	24 56	22 24	21 52	22 16	100	100
Gluyas Early ...	Early ...	24 16	24 48	27 36	26 32	25 52	25 49	116	116
M. 14 (Nabawa x Early)	Early ...	23 4	22 40	27 20	24 0	23 4	24 2	108	*
Nabawa ...	Midseason ...	18 56	21 28	23 20	23 28	23 52	22 13	100	100
Merredin ...	Early ...	25 4	25 4	27 44	27 52	28 40	26 53	121	110
S.H.J. ...	Early ...	22 40	23 52	27 52	26 24	25 28	25 15	110	92
Nabawa ...	Midseason ...	21 4	23 20	24 48	23 28	22 32	23 2	100	100
Carratin ...	Early ...	23 4	24 56	25 28	23 44	24 56	24 26	106	101
Geeralying ...	Very Early ...	22 48	23 36	23 28	22 48	24 8	23 22	102	97
Nabawa ...	Midseason ...	20 48	24 0	23 44	22 32	24 0	23 1	100	100
Noongaar ...	Very Early ...	27 44	30 0	30 0	28 40	30 24	29 22	128	117

* Planted 1930 only.

From the average results for the past three years it will be seen that Yandilla King, the standard late maturing variety, is too late for this district and even for early planting does not give as good returns as Nabawa. The new variety, Benubbin, has done well again in all sections. The early and very early varieties are obviously unsuitable for early planting, but they show to advantage in the May and June seeding.

In the May planting the varieties Merredin, Gluyas Early and Noongaar have given the best returns over the three years. They are, however, liable to Flag Smut, and for that reason it is interesting to observe that the new midseason variety, Benubbin, which is resistant to this disease, has given promising returns.

The new crossbred M. 20 (Nabawa x Gluyas Early) produced at this farm, is also Flag Smut resistant, and, maturing as it does about the same time as "Gluyas Early," shows promise of becoming the Standard Early Maturing Variety.

In the June planted section the results of Benubbin and M. 14 (Nabawa x Bencubbin) are for one year only, so that no definite conclusions can be arrived at. The average results for this year, however, show that, should it be found necessary

to extend the planting period into June, higher yields will be obtained by planting an early maturing variety. Gluyas Early and Noongaar have given the best returns for this purpose.

OAT VARIETY TRIAL.

This experiment has been conducted for the past eight years. The variety Mulga, an early dual purpose oat, is used as control. This trial includes only midseason and early varieties, as the late maturing varieties have proved unsuitable for the district. The experiment comprised both hay and grain sections, and included seven varieties.

The yields obtained from both the hay and grain sections are as follows:—

OAT VARIETY TRIAL.

Grain Section.

Planted 24th April, 1930. Seed—40lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yield per Acre.			Average Yields per acre, 1930.	Percentage Yields per acre, 1930.	Percentage Yields per acre, up to 1929
		Section 1.	Section 2.	Section 3.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Mulga	Early ...	39 8	35 8	32 8	35 21	100	100
Gidgee ...	Midseason	48 16	34 0	28 32	37 3	104	64
Guyra	Midseason	44 32	38 32	33 8	38 37	103	82
Mulga	Early ...	39 32	*	36 0	37 36*	100	100
Mulga	Early ...	38 16	34 24	37 0	36 27	100	100
Palestine ...	Early ...	47 16	41 32	38 24	42 24	116	98
Belar ...	Midseason	35 0	28 24	30 0	31 8	82	61
Mulga	Early ...	39 32	34 24	40 0	38 5	100	100
Mulga	Early ...	38 24	31 16	35 24	35 8	100	100
Burts Early (P. 1724)	Early ...	32 32	28 8	26 0	29 0	82	...
Burts Early (P. 1494)	Early ...	45 32	41 32	42 32	43 19	115	80
Mulga	Early ...	41 24	36 0	35 32	37 32	100	100

* Average of two plots only.

Hay Section.

Planted 24th April, 1930. Seed—40lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yield per Acre.		Average Yield per acre, 1930.	Percentage Yield per acre, 1930.	Percentage Yield per acre, up to 1929.
		Section 1.	Section 2.			
		cwt. qrs. lbs.	cwt. qrs. lbs.	cwt. qrs. lb.	%	%
Mulga	Early ...	58 2 8	55 1 12	56 3 24	100	100
Gidgee	Midseason ...	76 1 12	79 1 12	77 3 12	137	93
Guyra	Midseason ...	52 0 16	56 0 0	54 0 8	101	92
Mulga	Early ...	52 3 4	54 0 16	53 1 24	100	100
Mulga	Early ...	55 3 4	59 2 0	57 2 16	100	100
Palestine * ...	Early ...	57 0 16	57 2 16	57 1 16	100	...
Belar	Midseason ...	55 0 24	57 0 0	56 0 12	102	90
Mulga	Early ...	54 3 20	55 2 0	55 0 24	100	100
Mulga	Early ...	52 2 8	56 0 8	54 1 8	100	100
Burts Early (P. 1724)	Early ...	64 0 8	69 3 12	66 3 24	123	...
Burts Early (P. 1494)	Early ...	56 0 8	56 1 4	56 0 20	98	90
Mulga	Early ...	56 2 16	57 2 8	57 0 12	100	100

* Not planted in hay section previous to 1930.

This year, to facilitate the harvesting operations, the layout of this experiment was modified, and in consequence the average yields of previous years are not shown. The percentage results up to 1929 are, however, included for comparison. This year the yields obtained from all varieties for both hay and grain are very satisfactory. It will be noticed in the results for hay that the highest yield was obtained from the midseason variety, Gidgee, whilst for grain the highest yields were obtained from the early maturing varieties Palestine and Burts Early.

FIELD EXPERIMENTS WITH WHEAT, 1930.

CHAPMAN EXPERIMENT FARM.

I. Thomas, Superintendent of Wheat Farms,
and
F. L. Shier, B.Sc.(Agric.), Farm Manager.

The land in which the experiments were conducted varied from typical jam (*Acacia acuminata*) country to that of lighter timber country and had been cleared some years previously.

The past season was a rather adverse one for wheat-growing at this farm. The total rainfall for the year was 1,965 points, of which 1,856 points fell during the growing period. Such a heavy rainfall during these months has only been exceeded previously four times in twenty-five years.

The following is the rainfall for 1930, together with the 25 years' average:—

Year.	Jan.	Feb.	Mar.	Apl.	Growing Periods.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1930	...	...	34	57	117	915	460	159	121	84	1,856	14	4	1,965
Average, 25 years ...	26	48	65	44	234	438	399	263	162	96	1,592	29	22	1,826

No rain of any consequence fell until 9th May, and in view of past experience it was necessary to delay seeding until the rains had germinated the weed seeds. As an indication of the lateness of the season less than half the average rainfall for the period January-May had been recorded by the end of May. No less than 915 points fell during June, resulting in boggy and water-logged soil conditions which further delayed seeding operations and retarded the growth of crops already planted, particularly those in the low-lying portions of the paddocks. July was also a very wet month, but with the advent of warmer and drier conditions in August the growing conditions improved.

TIME OF SEEDING EXPERIMENT.

This experiment was commenced in 1923 and has been planted each year since with the early variety Gluyas Early, but owing to the plots being destroyed by fire in 1924 and other factors interfering with the results in 1925 and 1926 the results were not obtained for those years. Commencing in 1928, the mid-season variety Nabawa was included in the experiment.

Each variety was planted as a separate experiment, the Gluyas Early being planted in mid-May, June and July, and Nabawa in mid-April, May and June.

The land was ploughed during July, 1929, with a mouldboard plough and was springtyne cultivated in October, and further cultivations were necessary in March and April to obtain the desired tilth prior to seeding the April plots.

All the Gluyas Early plots were again cultivated when the May section was planted. The June and July plots received a further cultivation at the time the June section was planted, and the July plot was again cultivated prior to seeding.

The Nabawa plots were treated in a similar manner, that is, as each section was planted the remaining plots not planted were cultivated also. This insured the ground being free of weeds and in good tilth.

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Seed—60lb. per acre. Superphosphate 112lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928—30.	Percentage Yields, 1928—30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
April 14th	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
May 16th	10 16	11 36	10 40	11 36	11 36	11 9	100	11 14	100
June 16th	11 12	11 52	9 20	10 8	8 48	10 16	92	10 31	93

Variety—Gluyas Early. Seed—60lb. per acre. Superphosphate—112lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928—30.	Percentage Yields, 1928—30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
May 16th	11 12	11 52	10 8	11 20	12 16	11 22	100	16 2	100
June 16th	12 8	13 20	13 20	12 32	12 32	12 46	112	13 35	84
July 16th	7 12	7 28	6 32	5 4	4 48	6 13	55	8 22	52

The results of these years' plots are influenced to a large extent by the nature of the season, particularly with the early sown Gluyas Early. The average results for the previous seven years (1923-29) indicated that for this variety the May planting gave the best returns, the yields falling off considerably as the planting was delayed. This year the effect of the very heavy June rains was such that the growth of the May sowing was retarded to such an extent that the plants never wholly recovered. However, the average results for eight years indicate to be a mountain planter that for normal seasons May is the best month for planting the early variety Gluyas Early.

The results with the mid-season variety confirm those of the previous seven years, with the exception that the April-sown plots, the average yield of which was below that of previous years. This was due to the unfavorable wet conditions which checked the early sown crops.

RATE OF SEEDING EXPERIMENT.

This experiment is carried out with a sparse stooling variety, S.H.J., and a tree stooling variety, Nabawa, the object being to ascertain the most economical rate at which to plant the wheat crop. This experiment has been conducted continuously since 1923. In 1927, however, the results of the tree stooling variety were influenced by other factors, and hence are not included in the averages.

The land was ploughed in July, 1929, with a mouldboard plough and springtyne cultivated in October and prior to seeding the Nabawa plots in May. The S.H.J. plots received a further cultivation before being seeded. A good germination was obtained.

Planted on 16th May, 1930. Variety—Nabawa. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Avergge Yields per acre, 1930.	Per-centage Yields, 1930.	Average Yields per acre, 1923–30.	Per-centage Yields, 1923–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
60lb.	15 28	16 32	13 20	11 36	10 40	13 31	97	15 10	99
45lb.	15 12	15 44	13 12	12 48	12 48	13 57	100	15 17	100
90lb.	17 52	17 20	15 4	14 24	15 28	16 2	115	16 13	106

Planted on 6th June, 1930. Variety—S.H.J. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Per-centage Yields, 1930.	Average Yields per acre, 1923–30.	Per-centage Yields, 1923–30
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb	%	bus. lb.	%
60lb.	17 52	14 24	14 24	14 32	11 52	14 37	110	16 27	105
45lb.	14 40	13 36	11 20	14 48	11 52	13 15	100	15 38	100
90lb.	15 20	15 4	14 8	14 16	12 16	14 13	107	16 55	108

The results obtained with the sparse stooling variety indicate that it is an advantage to increase the rate of seeding above 45 lbs. per acre.

With the free stooling variety Nabawa both the results for this year and the average results for the previous years show that higher yields are obtained on this class of soil when heavy rates of seed are sown.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

This experiment was commenced in 1928 with the object of determining whether, when heavy dressings of superphosphate are used, it would be economical to apply part or all of this fertliser when cultivating the fallowed land during late summer or early autumn, thus enabling seeding operations to be expedited.

To suit the requirements of this experiment three plots were used and each section was repeated five times.

The land on which the experiment was conducted was ploughed with a heavy mouldboard plough in July the previous year. It was cultivated with a spring-tyne cultivator during October and again in March when the fertiliser was applied, and also when the experiment was planted.

The detailed results obtained this year, together with the average results for the three years the experiment has been in progress, are shown hereunder:—

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 19th May, 1930. Variety—Nabawa. Seed—60lb. per acre.

Time of Application of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Per-centage Yields, 1930.	Average Yields per acre, 1928–30.	Per-centage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
75lb. In March; 150lb. at seeding	11 44	9 20	10 48	10 24	13 4	11 4	95	13 23	105
225lb. in March ...	12 56	11 12	11 44	11 36	10 32	11 36	100	12 43	100
150lb. in March; 75lb. at seeding	13 28	11 4	11 52	10 32	11 12	11 38	100	13 1	102

The experiment has not been conducted sufficiently long enough for definite conclusions to be derived.

The results this year do not agree with those of the previous years, which indicated that the yield was increased when the greater part of the superphosphate was applied at seeding time.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

The object of this experiment is to ascertain the most profitable rates of superphosphate to apply to the wheat crop.

To meet the requirements the experiment was designed so that the three-plot system could be maintained. It was therefore divided into two sections, viz.:—

Section 1, consisting of three plots which received, respectively, 300 lbs., 150 lbs., and 225 lbs. of superphosphate per acre.

Section 2, consisting of three plots which received, respectively, no superphosphate, 150 lbs., and 75 lbs. of superphosphate per acre.

The land was ploughed with a mouldboard plough in July, 1930, and was cultivated with a springtyne cultivator in October and prior to seeding.

The results of the experiment are shown in the following table:—

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT No. 1.

Planted on May 20th, 1930. Variety—Nabawa. Seed—60lb. per acre.

Rate of Application of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
300lb.	9 28	10 56	11 4	12 0	*	10 52	90	12 57	101
150lb.	9 44	12 8	11 20	14 56	*	12 2	100	12 51	100
225lb.	9 12	11 4	11 20	16 8	*	11 56	99	13 34	106

* Results not included owing to proximity to trees.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT No. 2.

Planted on May 19th, 1930. Variety—Nabawa. Seed—60lb. per acre.

Rate of Application of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
No Superphosphate ...	12 48	12 8	12 48	13 44	13 52	13 4	96	10 34	85
75lb.	14 32	13 36	11 52	14 8	12 56	13 25	99	11 33	93
150lb.	13 36	13 52	13 44	13 36	12 56	13 33	100	12 25	100

It was not possible to conduct this experiment at this farm on land to which superphosphate had not been applied previously. Consequently the yields of the plots receiving no superphosphate this year would benefit by the residual effect of the superphosphate previously applied. As the experiment will be planted on the same land each year, this residual effect will eventually disappear.

SEASONAL PLANTING EXPERIMENT.

The objects of this experiment are:—

1. To ascertain the most suitable month to plant the Late, Mid-season, Early and Very Early maturing varieties of wheat.

2. To determine the most prolific of each of the above types.

To meet the requirements of the experiment three sections were needed, viz.:—

(a) Section 1. Planted in April, representing early planting.

(b) Section 2. Planted in May, representing mid-season planting.

(c) Section 3. Planted in June, representing late planting.

Each section planted in its respective month was repeated five times; all plots eventually harvested for grain.

The standard mid-season variety Nabawa was planted in the control plots in all sections.

The land on which the experiment was planted was ploughed with a mouldboard plough in August, 1929, and springtyne cultivated in September.

April planting. The soil was cultivated prior to seeding on 16th April, in addition to the cultivations already outlined.

SEASONAL PLANTING EXPERIMENT.

April Planting.

Planted on 16th April, 1930. Seed—60lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1928–30
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King	Late ...	4 48	4 48	4 8	5 20	5 12	4 51	61	76
Nabawa ...	Midseason ...	8 8	8 24	6 48	9 12	7 12	7 57	100	100
Sutton	Late ...	5 28	7 4	7 36	11 36	7 28	7 50	99	*
Bencubbin ...	Midseason ...	8 56	10 8	10 40	13 44	10 40	10 50	160	*
Nabawa ...	Midseason ...	7 4	6 40	6 16	7 52	6 0	6 46	100	100
Gluyas Early ...	Early ...	8 32	7 36	7 12	9 36	7 20	8 3	119	102

* Planted 1930 only.

The very heavy winter rains retarded the growth of the plants, and consequently adversely affected the yields. The new mid-season variety, Bencubbin, which was planted for the first time this year, gave comparatively good yields. The new late maturing variety Sutton was only slightly below the yield of the control variety Nabawa, but considerably better than the late variety, Yandilla King.

May planting. In addition to the cultivations outlined, the land was again cultivated prior to seeding on 22nd May.

May Planting.

Planted on 22nd May, 1930. Seed—60lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1928–30
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King ...	Late ...	8 40	8 8	9 12	10 0	10 0	9 12	86	92
Nabawa ...	Midseason ...	9 36	9 20	11 4	11 44	12 0	10 45	100	100
Sutton	Late ...	11 36	10 56	12 32	13 36	13 12	12 22	115	*
Bencubbin ...	Midseason ...	13 4	10 40	12 16	13 44	12 48	12 30	122	*
Nabawa ...	Midseason ...	10 40	9 4	10 0	10 56	10 32	10 14	100	100
Gluyas Early ...	Early ...	10 48	10 32	10 48	12 48	11 4	11 12	109	97
Geeralying ...	Very Early ...	12 16	11 36	11 28	12 8	10 0	11 30	113	97
Nabawa ...	Midseason ...	10 0	10 16	9 36	11 4	10 0	10 11	100	100
Comeback ...	Early ...	8 56	9 28	8 40	9 28	7 52	8 53	87	88†
Carrabin ...	Early ...	9 4	9 20	9 44	10 8	9 4	9 28	94	98
Nabawa ...	Midseason ...	9 44	9 20	10 16	10 56	9 52	10 2	100	100
Merredin ...	Early ...	9 52	10 0	11 52	10 0	8 48	10 6	101	102
S.H.J.	Early ...	9 44	9 36	9 52	10 16	8 32	9 36	97	102
Nabawa ...	Midseason ...	8 32	9 36	10 16	11 28	9 52	9 57	100	100
Noongaar ...	Very Early	9 12	6 56	8 48	9 4	6 48	8 10	82	79

* Planted 1930 only. † Average two years, 1929–30.

Slightly higher yields were obtained in this section on account of being freer of weeds. The outstanding variety this year was the mid-season maturing variety Bencubbin, while Sutton and Geeralying, late and very early maturing varieties respectively, gave good returns. The average results for the three years the experiment has been conducted show comparatively uniform yields in this section.

June planting. Owing to weed growth it was necessary further to cultivate the land in May and prior to seeding on 17th June, resulting in a clean seed bed.

June Planting.

Planted on 17th June, 1930. Seed—60lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Geeralying ...	Very Early...	13 12	10 16	14 32	14 0	11 12	12 38	94	90
Nabawa ...	Midseason ...	12 8	11 20	15 28	15 52	12 32	13 28	100	100
Bencubbin ...	Midseason ...	13 44	13 4	17 4	16 40	13 44	14 51	110	*
Gluyas Early ...	Early ...	12 32	12 24	13 12	12 56	12 8	12 38	93	92
Nabawa ...	Midseason ...	12 56	13 28	13 20	15 12	12 48	13 33	100	100
Comeback ...	Early ...	11 44	10 56	10 16	10 56	10 0	10 46	80	*
Carrabin ...	Early ...	12 48	11 20	11 12	11 20	11 44	11 41	87	*
Nabawa ...	Midseason ...	13 12	13 4	13 52	13 44	13 4	13 23	100	100
Merredin ...	Early ...	12 24	10 40	10 56	12 56	12 16	11 50	88	90
S.H.J.	Early ...	14 0	11 28	11 4	14 24	13 52	12 58	94	93
Nabawa ...	Midseason ...	14 32	11 44	14 32	14 0	14 0	13 46	100	100
Noongaar ...	Very Early	9 20	8 8	7 28	9 12	8 40	8 34	62	81

* Planted 1930 only.

With the exception of Bencubbin, none of the varieties yielded better than the control variety. The sparse stooling varieties gave poor returns. This cannot be accounted for, as it would be expected that the quick-growing varieties, when planted so late in the season, should show to advantage.

FIELD EXPERIMENTS WITH WHEAT AND OATS, 1930.

WONGAN HILLS LIGHT LANDS FARM.

I. THOMAS, Superintendent of Wheat Farms, and
A. R. VENTON, Farm Manager.

The past season was more favourable for the growth of the crop than that of the previous year; although the rainfall was again below the average, it was more evenly distributed.

The following table shows the monthly rainfall for 1929 and 1930 as recorded at the farm, together with the averages for the past 17 years as officially recorded at the Wongan Hills township, four miles distant.

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for Year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1930	7	...	53	92	66	367	321	149	90	55	1,048	1	98	1,299
1929	22	217	85	...	261	426	172	140	35	141	1,175	38	4	1,341
17 years' average ...	44	55	97	62	196	300	273	195	126	94	1,191	41	49	1,538

Useful rains fell in April, and those varieties planted during that month obtained a good start. The latter part of May was warm and dry, and as a result a little malting occurred in those portions of the crop planted after the first week in May.

The land on which the experiments were conducted was virgin country prior to being fallowed in 1929, consisted mainly of the smokebush and tussocky types of sand plain. It was ploughed from June to early August, 1929, with a disc implement (Sundercut), cross cultivated with the same implement during August and September, and again cultivated with the same implement in March and early April. Prior to seeding it was tandem disc cultivated. Excepting where the requirements of an experiment necessitated otherwise, the cultural details for all the experiments were as outlined. Where the Rates of Superphosphate and Time of Application of Superphosphate Experiments were planted, the ground was scrub-raked during January and February.

TIME OF SEEDING EXPERIMENT.

This experiment is being conducted to determine the most suitable month for planting the wheat crop in this district.

The early maturing variety, Gluyas Early, and the midseason-maturing variety, Nabawa, were used, the former being planted mid-May, June, and July, and the latter in April, May, and June.

The plots sown in April germinated well and made good growth, and were healthy and robust throughout the season. Owing to the dry conditions during the latter half of May, the May sown plots did not germinate until 12th June, and were somewhat uneven. Until early spring growth was slow, although healthy. The general appearance imporved rapidly in spring.

The June sown plots were poor and spindly throughout the season, and did not improve much in spring. Although little more than a fortnight later than the May sown plots in actual growth, the difference was very marked.

The July sown plots were very much poorer throughout the season than the June plots.

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
April 16th	16 40	16 8	16 8	14 16	14 56	15 38	121	16 13	109
May 16th	13 52	13 20	13 36	12 0	11 52	12 56	100	14 50	100
June 17th	8 40	9 28	9 4	8 16	8 16	8 45	68	6 57	47

Variety—Gluyas Early. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
June 17th	7 44	8 40	9 20	9 28	9 20	8 54	66	7 29	53
May 16th	11 52	12 16	13 52	14 16	15 4	13 28	100	14 0	100
July 15th	3 20	3 36	4 24	4 0	3 28	3 46	28	4 58	35

These results again confirm in no uncertain manner those of former years, viz., it is essential that seeding should be completed before the end of May.

RATE OF SEEDING EXPERIMENT—WHEAT.

As was the case in previous years, the experiment was conducted with two varieties, Nabawah (midseason maturing), representing the free stooling and S.H.J. (early maturing), representing the sparse stooling types respectively.

The germination of Nabawa was fair, but the warm dry spell during the latter half of May induced upward growth at the expense of stooling. Early in the season the lightest sowing appeared rather thin, but as the season advanced practically no difference could be seen.

When mature, the lightest sowing was slightly taller, but in general appearance there was practically no other difference.

Although planted on 16th May, the S.H.J. did not germinate until 12th June, owing to insufficient moisture. Consequently germination was not as good as usual, and stooling and growth generally were very poor indeed. There was not much difference between the two heavier rates of seeding at any time throughout the season.

Rate of Seeding Experiment.

Planted on 29th April, 1930. Variety—Nabawa. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1925–30.	Percentage Yields, 1925–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
60lb.	12 48	12 32	13 20	13 20	13 12	13 2	100	15 2	103
45lb.	12 32	13 12	13 12	13 20	12 48	13 1	100	14 37	100
90lb.	13 4	13 28	13 20	13 4	13 12	13 14	102	14 54	103

Planted on 16th May, 1930. Variety—S.H.J. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1925–30.	Percentage Yields, 1925–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
60lb.	8 24	8 40	8 0	8 16	7 36	8 11	106	12 18	103
45lb.	8 8	7 44	8 8	7 20	7 28	7 46	100	11 58	100
90lb.	8 48	8 40	8 24	8 32	8 40	8 37	111	12 37	105

These results confirm those of previous years, viz., that with a free stooling variety of wheat no advantage is gained by seeding more than 45 lbs. of seed per acre. With a sparse stooling variety, however, the rate may be increased above 45 lbs. with some little advantage, but no benefit is derived by planting at a rate greater than 60 lbs. per acre.

RATE OF SEEDING EXPERIMENT—OATS.

As was the case for the similar experiment with wheat, this was planted with both a free and a sparse stooling variety, and the land also was prepared identically with that for the wheat experiment.

Germination and growth of both varieties were very good. There was little difference between the plots throughout the season. The Algerian, although slow growing, compared with Burts, was healthy and even, and made rapid growth in late spring. The yields obtained, however, did not come up to expectations.

RATE OF SEEDING OATS EXPERIMENT.

Planted on 29th April. Variety—Algerian. Superphosphate—150lb per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1926–30.	Percentage Yields, 1926–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
45lb.	14 16	14 32	12 24	12 32	12 0	13 13	105	13 11	111
30lb.	13 24	13 16	12 0	11 32	12 24	12 27	100	11 37	100
60lb.	14 8	12 32	13 0	12 32	12 32	13 5	103	13 14	112

Planted on 1st May. Variety—Burt's Early. Superphosphate—150lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1926–30.	Percentage Yields, 1926–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
45lb.	11 16	12 32	13 0	13 16	13 8	12 30	106	14 6	101
30lb.	11 0	11 8	12 16	12 24	13 8	12 3	100	13 38	100
60lb.	13 8	13 32	13 16	12 24	13 32	13 4	111	14 18	104

This year's results confirm the average results of the past four years, namely, that no benefit is derived by increasing the rate over 45 lbs. per acre with a late variety like Algerian.

With the sparse stooling variety, the results this year show that increased yields are obtained by the heavier rates of seeding.

The average results for the five years the experiment has been conducted, however, show that the increased yields do not compensate for the increased amount of seed required for planting.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

The object of this experiment is to determine whether, when heavy dressings of superphosphate are applied, it would be profitable to apply part or whole of the amount when cultivating the fallowed land during the late summer and early autumn.

For the purposes of the experiment, three plots were required.

Plot 1 received 75 lbs. in March and 150 lbs. at seeding.

Plot 2 was treated as control and received the whole 225 lbs in March.

Plot 3 received 150 lbs. in March and 75 lbs. at seeding.

Growth generally was healthy and even. The warm spell during the latter half of May forced upward growth somewhat at the expense of stooling.

At maturity the whole experiment was fairly even in height and general appearance, although the control plots seemed less dense when closely examined.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 23rd April, 1930. Variety—Nabawa. Seed—45lb. per acre. Superphosphate—225lb. per acre.

Time of Application of Superphosphate.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
75lb. in March ; 150lb. at seeding	14 56	15 44	16 16	16 40	16 16	15 58	111	17 19	117
225lb. at seeding ...	13 44	13 20	15 36	15 4	14 32	14 27	100	14 47	100
150lb. in March ; 75lb. at seeding	14 48	15 36	15 44	16 0	16 32	15 44	109	16 16	110

These results confirm those of last year, viz., that yields are decreased when all or portion of the superphosphate is not applied at seeding time.

RATE OF SUPERPHOSPHATE EXPERIMENT.

The object of this experiment is to determine the most profitable amount of superphosphate to apply on this type of country.

Two sections of 15 plots each were planted. In No. 1 section the rates of superphosphate were 150 lbs., 225 lbs., and 300 lbs. per acre; and in No. 2, 75 lbs., 150 lbs., and no superphosphate, each being repeated five times.

Germination throughout the experiment was fairly even, but from the time the plants were just above the ground, the plots without superphosphate made absolutely no growth until the spring and many of the plants died. Very few of the plants produced grain, and were only from 4in. to 6in. high.

There was no visible difference between the three heavy dressings during the season, although at maturity there was a very slight difference in favour of the two heaviest dressings. Excepting those plots which received no superphosphate, growth was healthy and even throughout the season. The warm spell during the latter half of May forced upward growth, somewhat at the expense of stooling.

RATE OF SUPERPHOSPHATE EXPERIMENT.

No. 1 Section.

Planted on 23rd April, 1930. Variety—Nabawa. Seed—45lb. per acre.

Rate of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
225lb.	15 28	15 44	15 36	16 8	15 52	15 46	103	12 22	105
150lb.	14 56	14 48	15 20	15 44	16 0	15 22	100	11 54	100
300lb.	15 36	15 12	15 36	16 0	16 32	15 47	103	12 30	104

No. 2 Section.

Rate of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
No super.	...	...	...	...	...	...	...	...	...
150lb.	15 44	15 20	14 32	15 20	15 12	15 14	100	...	...
75lb.	11 44	12 32	12 56	12 48	12 24	12 29	82	...	...

This year's results again show that although it is advantageous to apply considerably more than 75 lbs. of superphosphate per acre on this class of land, it is not profitable, due to the prevailing price of wheat, to exceed an application of 120 lbs. per acre.

SEASONAL PLANTING EXPERIMENT.

The objects of the experiment are:—

1. To ascertain the most suitable month to plant the Late, Midseason and Early maturing varieties of wheat.
2. To determine the most prolific of each of the above types.

To meet the requirements of this experiment three sections were needed, viz.:—

(a) Section 1, planted in April, representing Early planting.

(b) Section 2, planted in May, representing Midseason planting.

(c) Section 3, planted in June, representing Late planting.

Each section planted in its respective month was repeated five times, all plots being eventually harvested for grain.

The soil was mainly of the smokebush type, but was rather more sandy and loose than the average.

April Planting.—Germination was fairly good, but growth was forced upwards somewhat by the warm dry climatic conditions during the latter half of May. There was little difference at first between varieties, but the later ones gradually fell behind the remainder. Growth generally was healthy throughout the season. Gluyas Early made the most rapid growth, and was inclined to lodge at maturity. Bencubbin suffered somewhat from the excessive wet in July, but soon recovered, and at maturity had slightly the best general appearance.

May Planting.—Although planted at the middle of May, germination did not take place until 12th June. Stooling was poor, and growth throughout the season was slow. There was very little difference between the varieties, although the early ones gradually went ahead. At maturity all varieties were very short. Both Noongaar and Merredin lodged badly and were difficult to harvest. Geeralying and Merredin were inclined to shed a little after a strong wind. Bencubbin and Nabawa had the best general appearances, the former being slightly the better of the two.

June Planting.—Germination was uneven, while stooling and growth generally were very poor. Although only a fortnight later in actual growth, all varieties were very much inferior to the May sowing. There was very little difference between varieties throughout the season, and at maturity all were very short.

SEASONAL PLANTING EXPERIMENT.

April Planting.

Planted on 17th April, 1930. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King ...	Late ...	13 36	14 0	14 24	14 0	14 8	14 2	100	99
Nabawa ...	Midseason ...	14 32	14 0	14 8	14 0	13 52	14 6	100	100
Baroota Wonder Early	Late ...	13 44	13 44	13 28	12 56	11 52	13 9	93	97
Bencubbin ...	Midseason ...	17 20	17 4	17 20	17 36	16 16	17 7	132	*
Nabawa ...	Midseason ...	13 44	13 12	12 56	12 56	12 0	12 58	100	100
Gluyas Early ...	Early ...	14 8	15 4	15 4	14 48	13 36	14 32	112	96

* Planted 1930 only.

May Planting.

Planted on 15th and 16th May, 1930. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, per acse, 1930.	Percentage Yields, per acre, 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King ...	Late ...	11 28	11 4	10 24	9 28	8 8	10 16	92	90
Nabawa ...	Midseason ...	13 36	11 52	11 12	10 8	8 24	11 2	100	100
Baroota Wonder Early	Late ...	10 56	10 16	9 12	8 24	7 12	9 12	83	87
Bencubbin ...	Midseason ...	16 0	14 48	13 44	12 56	10 32	13 36	124	*
Nabawa ...	Midseason ...	12 48	12 24	11 20	10 24	8 8	11 1	100	100
Gluyas Early ...	Midseason ...	12 8	12 0	11 12	10 8	7 44	10 38	97	113
Merredin ...	Early ...	10 16	10 8	9 36	8 24	7 4	9 6	96	93
Nabawa ...	Midseason ...	10 40	10 16	9 28	9 20	7 44	9 30	100	100
Carrabin ...	Early ...	12 56	11 44	10 32	10 32	7 28	10 38	112	101
S.H.J.	Early ...	11 44	10 16	8 40	8 32	6 56	9 14	91	86
Nabawa ...	Midseason ...	12 32	11 4	10 16	9 20	7 28	10 8	100	100
Geeralying ...	Very Early	11 44	9 52	8 8	7 20	6 0	8 37	85	78
Nabawa ...	Midseason ...	12 56	10 32	10 16	8 16	7 28	9 54	100	100
Noongaar ...	Very Early	9 4	7 36	6 40	5 44	5 20	6 53	70	65

* Planted 1930 only.

June Planting.

Planted on 17th June, 1930. Seed—45lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields per acre, 1930.	Percentage Yields, 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Geeralying ...	Very Early...	4 48	5 20	5 20	5 20	6 32	5 28	85	88
Nabawa ...	Midseason ...	5 28	6 24	6 8	6 16	7 44	6 24	100	100
Bencubbin ...	Midseason ...	6 32	6 48	7 4	8 8	8 40	7 26	116	†
Carrabin ...	Early ...	5 44	5 52	5 52	5 44	7 20	6 6	89	92
Nabawa ...	Midseason ...	5 20	6 24	6 40	7 52	8 0	6 51	100	100
Gluyas Early ...	Early ...	5 12	5 20	6 16	6 8	7 12	6 2	88	91
Merredin ...	Early ...	6 8	5 4	6 8	6 24	7 20	6 13	93	*94
Nabawa ...	Midseason ...	6 40	6 0	6 24	6 48	7 28	6 40	100	100
S.H.J.	Early ...	5 44	5 36	5 36	6 48	7 20	6 13	93	83
Noongaar ...	Very Early	4 0	3 4	3 20	5 20	6 0	4 5	61	75

* Average 2 years. † Planted 1930 only.

These results again emphasise the necessity for early planting on this class of soil.

The early part of the winter being unusually mild, the May planting did not suffer as much as it would have done under normal conditions, but the yields are much below the early sowing.

OAT VARIETY TRIAL.

As in former years, this experiment consisted of eight sections, three of which were cut for hay and the balance harvested for grain.

Germination was fair, but growth was very slow. During the early part of the season there was little difference between varieties, excepting that Belar and Algerian were somewhat backwards. As the season advanced this became more pronounced, and Belar in particular contained much red and yellow flag. Gidgee also was slightly affected.

Owing to the position of the early maturing variety, Palestine, it was not possible to harvest it when ready and consequently the results obtained are not included for comparison. However, during the growing period, this variety gave promise of yielding as well as the control variety.

The variety Gidgee ripened very irregularly and lodged as soon as ripe. Belar improved at the end of the season. All varieties were short in the straw, and, as is usual with oats on new land, the yields were disappointing, as are shown by the following results:—

OAT VARIETY TRIAL.

Grain Section.

Planted on 6th and 7th May, 1930. Seed—40lb per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average percentage Yield 1926–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Burts Early ...	Early ...	12 24	13 24	10 24	11 24	11 32	12 2	100	100
Mulga	Early ...	11 8	12 16	9 24	10 24	11 8	11 0	91	95
Belar	Midseason ...	11 16	12 0	10 8	10 16	9 24	10 29	93	*
Burts Early ...	Early ...	12 16	13 8	10 32	11 8	10 8	11 22	100	100
Burts Early ...	Early ...	13 8	13 0	11 16	11 0	10 32	11 35	100	100
Algerian ...	Late ...	14 8	14 24	12 8	11 32	11 16	12 34	103	115
Guyra	Midseason ...	12 0	12 24	10 8	9 32	9 24	10 34	96	107
Burts Early ...	Early ...	12 16	12 32	11 0	10 24	9 32	11 13	100	100
Burts Early ...	Early ...	12 0	13 0	10 24	11 8	10 16	11 18	100	100
Lachlan ...	Midseason ...	11 0	11 32	10 0	9 24	9 24	10 16	91	106
Burts Early ...	Early ...	12 8	11 24	10 32	10 16	9 24	10 37	100	100
Burts Early ...	Early ...	12 16	12 16	11 32	10 32	10 0	11 19	100	100
Gidgee	Midseason ...	10 8	9 24	9 16	8 32	8 16	9 11	81	*

* Planted in 1930 only.

Hay Section.

Planted 6th and 7th May, 1930. Seed—40lb. per acre. Superphosphate—150lb. per acre.

Variety.	Maturity.	Computed Yield per Acre.									Average Yield per acre, 1930.			Percentage Yield 1930.	Average percentage Yield 1926–30.
		Section 1.			Section 2.			Section 3.							
		cwt.	qrs.	lb.	cwt.	qrs.	lb.	cwt.	qrs.	lb.	cwt.	qrs.	lb.	%	%
Burts Early ...	Early ...	20	2	8	17	1	4	13	3	20	17	1	1	100	100
Mulga	Early ...	18	1	4	13	0	24	13	0	8	14	3	12	86	110
Belar	Midseason ...	17	2	24	10	2	0	9	2	0	12	2	8	81	*
Burts Early ...	Early ...	15	0	24	15	1	20	13	1	12	14	2	19	100	100
Burts Early ...	Early ...	15	3	4	13	1	4	14	1	12	14	1	26	100	100
Algerian	Late ...	14	2	8	9	1	12	9	2	24	11	0	24	77	87
Guyra	Midseason ...	15	1	12	10	0	0	11	1	12	12	0	27	93	96
Burts Early ...	Early ...	14	3	12	12	2	16	12	0	8	13	0	21	100	100
Burts Early ...	Early ...	15	0	16	11	3	4	12	1	12	13	0	11	100	100
Lachlan	Midseason ...	11	0	8	8	0	0	8	0	8	9	0	5	69	96
Palestine ...	Early ...	12	3	4	10	2	8	7	3	12	10	1	17	85	*
Burts Early ...	Early ...	14	0	0	13	3	4	8	3	20	12	0	27	100	100
Burts Early ...	Early ...	16	1	4	13	0	0	10	1	12	13	0	24	100	100
Gidgee	Midseason ...	13	2	8	7	2	24	7	0	8	9	1	23	72	*

* Planted in 1930 only.

As would be expected, owing to the low rainfall in the spring, the early maturing varieties gave the best hay returns. The average results for five years indicate that the early maturing variety, Mulga, is the most suitable for hay.

The late maturing variety, Algerian, which has given the best grain yields over the period that the experiment has been conducted, again yielded well this year, benefiting as it did by the rains in October, which came too late for the earlier maturing varieties.

FIELD EXPERIMENTS WITH WHEAT, 1930.

SALMON GUMS EXPERIMENT FARM.

I. THOMAS, Superintendent of Wheat Farms, and
L. G. SEINOR, Farm Manager.

The rainfall for the greater part of the past season was favourable for the growth of the wheat crops. The heavy rains which fell in March facilitated the preparation of a good seed bed in addition to assuring reserves of moisture in the subsoil. Seeding operations were carried out under ideal conditions, and the germination of the seed was excellent. Favourable growing conditions continued until the end of August. Light falls were recorded during September, but the crops did not derive full advantage from these because of the drying winds which were later experienced.

The monthly rainfall, as recorded at the farm for both years 1930 and 1929, together with the average for the past 12 years as recorded at Salmon Gums, one mile distant, is as follows:—

—	Jan.	Feb.	Mar.	Apl.	Growing Periods.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
At Farm, 1930 ...	...	...	312	162	269	156	92	230	73	17	837	14	298	1,623
At Farm, 1929 ...	106	65	73	26	125	207	159	163	21	35	710	150	43	1,173
Average, 1926–30 ...	33	35	203	99	133	113	139	167	80	88	720	40	74	1,204
Salmon Gums Town, 1919–30	29	46	128	113	165	151	132	141	110	113	812	75	98	1,301

The area on which the experiments were planted originally carried silver mallee, silver bark, tea tree and other light mallee, and was cleared in 1926, fallowed 1927, and cropped in 1928. In preparation for the planting this year it was ploughed to a depth of 4in. with a disc-cultivating plough in June-July, 1929, cross ploughed in November, springtyne cultivated in January, and prior to seeding.

TIME OF SEEDING EXPERIMENT.

The object of this experiment is to determine the most suitable time for planting the wheat crop.

Two varieties were used, the midseason variety, Nabawa, being sown in mid April, May, and June, and the early variety, Gluyas Early, in mid May, June, and July.

Immediately prior to each planting, all plots not then planted received a further cultivation with a springtyne implement.

Germination was good throughout.

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Superphosphate—112lb. per acre. Seed—45lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.		bus. lb.	
April 12th	16 0	16 0	16 24	14 8	17 20	15 58	105	14 14	107
May 12th	15 20	16 16	14 24	13 36	16 40	15 15	100	13 20	100
June 19th	10 0	10 8	10 24	9 44	10 56	10 14	67	7 41	58

Variety—Gluyas Early. Superphosphate—112lb. per acre. Seed—45lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
14th June	15 20	15 20	15 44	16 24	15 20	15 38	70	12 9	70
14th May	19 28	18 48	19 36	20 0	19 20	19 26	100	17 27	100
14th July	11 28	12 16	11 36	13 12	11 20	11 58	62	9 32	55

This experiment again demonstrates that the yields of both early and midseason varieties are considerably reduced when the crop is planted later than the month of May.

The Seeding Calendar for the Esperance Wheat Area, in which this farm is located, is as follows:—

Variety.	Maturity.	Northern.	Central.	Southern.
		Beete, Kumarl, Dowak and Salmon Goms.	Circle Valley, Red Lake, Grass Patch.	Treslove, Scaddan.
Yandilla King	Late ...	...	April 1 to 15 ...	April 1 to 21
Nabawa ...	Midseason ...	April 15 to May 7	April 15 to May 7	April 21 to May 21
Gluyas Early	Early ...	May 1 to 21 ...	May 1 to 21 ...	May 10 to 21
Noongaar ...	Very Early...	May 21 to 31 ...	May 21 to 31 ...	...

RATE OF SEEDING EXPERIMENT.

This experiment is conducted to determine the most profitable rate of seeding the wheat crop.

Two varieties were used, Nabawa, representing the free stooling varieties, and Noongaar, representing the sparse stooling varieties.

The results obtained are set out below:—

RATE OF SEEDING EXPERIMENT.

Planted on 11th May, 1930. Variety—Nabawa. Superphosphate—112lb. per acre.

Rate of Seed per acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb.	12 40	12 24	14 16	14 40	12 24	13 17	90	11 13	94
45lb.	14 40	14 40	14 32	15 20	14 16	14 42	100	11 54	100
60lb.	14 48	13 4	15 28	15 44	13 36	14 32	99	12 6	102

Planted on 14th May, 1930. Variety—Noongaar. Superphosphate—112lb. per acre.

Rate of Seed per acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb.	9 44	12 56	9 36	11 20	7 20	10 11	79	11 4	92
45lb.	12 48	12 56	13 4	12 24	13 4	12 51	100	12 3	100
60lb.	12 16	13 52	11 36	12 32	8 56	11 50	92	11 38	96

These results, as was the case the previous year, indicate that little or no advantage is derived from planting more than 45 lbs. of seed per acre.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

This experiment is conducted in order to determine whether, when applying heavy dressings of superphosphate, it would be profitable to apply part or all of the fertiliser when cultivating the fallowed land in late summer or early autumn, thus allowing seeding operations to be expedited.

The tabulated results for 1930, together with the averages for the previous years, are as follow:—

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 9th May, 1930. Variety—Nabawa. Seed—45lb. per acre.

Time of Application of Superphosphate.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
150lb. in March; 75 lb. at seeding	14 40	15 28	15 20	17 20	14 56	15 33	104	14 14	103
225lb. in March ...	15 52	14 8	14 40	14 56	15 28	15 1	100	13 46	100
75lb. in March; 150 lb. at seeding	14 24	15 52	17 36	14 40	14 24	15 23	102	14 57	109

The average results for the three years the experiment has been conducted show that the yields are decreased when a portion of the fertiliser is not applied at seeding time.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

This experiment has been modified, and is now divided into two sections. This allows of the introduction of a plot receiving no superphosphate, and one receiving 300 lbs. per acre. The object of the experiment is to determine the most profitable amount of superphosphate to apply to the wheat crop.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT NO. 1.

Planted on 7th May, 1930. Variety—Nabawa. Seed—45lbs. per acre.

Rate of Application of Superphosphate per acre.	Computed Yield per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
300lb.	14 40	15 28	14 40	15 12	16 16	15 15	98	14 16	106
150lb.	15 12	15 44	15 12	14 32	17 4	15 33	100	13 26	100
225lb.	14 32	13 44	15 4	15 52	14 40	14 46	95	14 27	108

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT NO. 2.

Planted on 7th May, 1930. Variety—Nabawa. Seed—45lb. per acre.

Rate of Application of Superphosphate per acre.	Computed Yield per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
No Superphosphate ...	6 56	9 20	8 0	8 0	8 56	8 14	59	6 37	45
150lbs....	13 52	14 0	13 36	14 8	13 52	13 54	100	14 45	100
75lb.	12 32	12 48	12 48	13 44	11 36	12 42	91	13 32	92

These results, which are for two years only, show that the yields are increased when heavier rates of superphosphate are applied.

With the present value of wheat, however, applications in excess of 112 lbs. appear to cease to be profitable.

SEASONAL PLANTING EXPERIMENT.

The objects of this experiment are:—

1. To ascertain the most suitable month to plant the late, midseason, early and very early maturing varieties of wheat.

2. To determine the most prolific of each of the above types.

To meet the requirements of the experiment three sections were made, viz.:—

(a) Section 1, planted in April, representing early planting.
(b) Section 2, planted in May, representing midseason planting.
(c) Section 3, planted in June, representing late planting.

Each section planted in its respective month was repeated five times, all plots being eventually harvested for grain.

The standard midseason variety was planted in the control plots in all sections.

The land on which the experiment was planted was ploughed with a disc-cultivating plough in June-July, 1929, cross ploughed in November, and cultivated in January with a springtyne implement. It was again given a springtyne cultivation in April. The May and June plots were cultivated and cross cultivated and harrowed in May to destroy the self-sown wheat and oats. The June plots received a further working prior to seeding, which took place on 21st June. Germination was good in all plots, but the growth of the June section was very slow and backward. The following are the results:—

SEASONAL PLANTING EXPERIMENT.

APRIL PLANTING.

Seed—45lb. per acre. Planted on 18th April, 1930. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yield per acre.					Average yield per acre, 1930.	Average percentage yield per acre, 1930.	Average percentage yield per acre, 1928-30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King	Late ...	18 40	18 16	19 52	16 48	20 0	18 43	104	88
Nabawa ...	Midseason ...	15 20	17 28	18 16	19 4	19 28	17 55	100	100
Sutton	Late ...	18 48	18 56	18 56	19 20	20 56	19 23	108	...
Bencubbin ...	Midseason ...	20 8	21 52	24 32	22 24	23 28	22 29	126	...
Nabawa ...	Midseason ...	15 28	17 44	18 8	18 40	19 4	17 49	100	100
Gluyas Early ...	Early ...	14 0	16 48	13 36	12 48	15 12	14 29	81	84
Noongaar ...	Very Early	13 20	12 8	12 56	12 0	13 36	12 48	71	*74
Nabawa ...	Midseason ...	15 52	19 20	18 56	19 20	16 32	18 0	100	100

* Average 2 years. 1929–30.

In this section the late maturing variety, Sutton, and the midseason variety, Bencubbin, which have been tried for the first time this year, have given encouraging results. The average results for the three years during which the experiment has been conducted indicate that for April planting the standard midseason variety, Nabawa, is most suitable. Early maturing varieties are obviously unsuitable for early planting when intended to be harvested for grain.

May Planting.

Planted on 19th May, 1930. Seed—45lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage, Yields 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	
Yandilla King	Late ...	12 8	16 40	16 56	12 48	12 48	14 16	90	78
Nabawa ...	Midseason ...	13 36	19 4	16 56	14 56	14 16	15 46	100	100
Sutton	Late ...	12 24	15 28	13 52	12 32	12 0	13 15	84	*
Bencubbin ...	Midseason ...	18 16	21 12	18 48	16 40	16 48	18 21	109	*
Nabawa ...	Midseason ...	18 16	19 20	17 28	15 20	13 44	16 50	100	100
Carrabin ...	Early ...	16 40	18 24	16 16	13 44	12 8	15 26	92	93
Merredin ...	Early ...	20 48	22 0	19 4	16 40	18 32	19 25	107	106
Nabawa ...	Midseason ...	19 36	19 52	18 16	16 56	16 16	18 11	100	100
Gluyas Early ...	Early ...	19 52	20 0	19 4	18 48	17 52	19 7	105	100
S.H.J.	Early ...	18 40	18 48	16 8	17 36	16 40	17 34	96	95
Nabawa ...	Midseason ...	18 40	19 52	16 32	20 40	15 36	18 16	100	100
Geeralying ...	Very Early	18 24	19 4	16 56	17 44	13 36	17 9	94	96
Noongaar ...	Very Early...	19 12	18 24	18 24	16 40	12 56	17 7	95	101
Nabawa ...	Midseason ...	21 36	19 52	16 24	15 28	17 12	18 6	100	100

* Planted 1930 only.

In this section also the variety, Bencubbin, gave very satisfactory results, whilst the late maturing varieties, Sutton and Yandilla King, yielded less than the controls. The results of the early maturing varieties, Merredin and Gluyas Early, indicate their suitability for planting during the month of May.

June Planting.

Planted on 21st June, 1930. Seed—45lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1928-30
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Bencubbin ...	Midseason ...	12 24	12 40	14 24	14 48	14 0	13 39	115	*
Nabawa ...	Midseason ...	10 40	11 20	11 44	13 36	12 8	11 54	100	100
Carrabin ...	Early ...	10 0	11 12	10 16	12 8	11 20	10 59	92	94
Merredin ...	Early ...	10 56	12 16	10 48	12 8	10 24	11 18	94	101
Nabawa ...	Midseason ...	11 36	12 56	11 28	12 16	11 52	12 2	100	100
Gluyas Early ...	Early ...	13 12	12 48	10 8	11 12	13 36	12 11	101	109
S.H.J.	Early ...	8 40	10 32	9 12	10 8	9 52	9 41	77	83
Nabawa ...	Midseason ...	12 16	13 4	11 36	13 4	12 48	12 34	100	100
Geeralying ...	Very Early	10 32	10 40	8 48	9 36	11 20	10 11	81	95
Noongaar ...	Very Early	13 12	12 56	10 32	12 0	13 20	12 24	98	112
Nabawa ...	Midseason ...	10 0	12 56	12 8	12 48	12 48	12 8	100	100

* Planted 1930 only.

The new variety, Bencubbin, again gave the best returns, but it must be remembered that this is the first year it has been tried. Over the period which the experiment has been conducted, it has been demonstrated that if it is necessary to prolong the seeding into June, it would be safer to use the very early maturing variety, Noongaar, or the early variety, Gluyas Early. Attention is drawn to the comparatively low yields of all varieties in this section to the yields in the section planted in May. This confirms the conclusion advocated, viz., that the yields are more satisfactory when the seeding is completed during the month of May.

FIELD EXPERIMENTS WITH WHEAT, 1930.

YILGARN EXPERIMENT FARM.

I. THOMAS, Superintendent of Wheat Farms.

Since cropping operations have been carried out at the farm (these commencing in 1929), the rainfall during the growing periods has been below that of the average for Southern Cross (a distance of 8 miles West) for the past 40 years.

The monthly registrations at the farm for 1930, together with the average for the past three years, and the average as recorded at Southern Cross for the past 40 years are set out hereunder:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1930	...	167	62	209	87	229	88	110	45	9	568	10	173	1,189
Average 3 years ...	43	95	58	86	177	150	104	75	34	25	565	101	77	1,025
Southern Cross average, 40 years ...	49	61	107	79	138	141	145	110	80	61	675	43	46	1,060

Following good rains during the months of February and March, copious rains were experienced in April, resulting in the subsoil becoming well supplied with moisture. These April rains caused seeding operations to be delayed, but after

the first week in May no further rain was recorded during that month, which enabled seeding to be proceeded with without interruption. Some anxiety, however, was caused by this prolonged dry period, as it was feared that malting of the seed would occur in the crops sown after the middle of May. This anxiety was relieved, by rains early in June. During the remainder of that month further good rains were recorded and owing to the mild climatic conditions which prevailed during July and August, the crops made vigorous growth. Unfortunately these favourable growing conditions did not continue into September. During this month the rainfall was scanty and several severe frosts occurred, combined with hot drying conditions during the day, which affected the crops. Little or no rain was experienced in October, so that they matured under adverse conditions, when it became apparent that the yields of earlier expectations would not be realised.

The land on which the experiments were conducted was originally timbered with salmon gum and gimlet, and was cleared in 1928. During June and July, 1929, in preparation for planting, it was ploughed with a disc cultivating plough to a depth of 4 inches. In September it was cultivated with a springtyne implement and was again cultivated with the same implement in February, after rain and prior to seeding.

Unless otherwise stated, these cultural operations refer to the land on which the experiments set out below were planted.

TIME OF SEEDING EXPERIMENT.

The object of this experiment is to determine the most suitable month to plant the wheat crop.

Two varieties of different maturity were used: Nabawa, a mid-season; and Gluyas Early, an early-maturing variety.

The Nabawa plots were planted in mid-April, May and June; and the Gluyas Early were planted mid-May, June and July.

The April sown plots germinated after good rain on the 19th and 20th. The May sown plots of both varieties did not germinate until after rain on 2nd June. All plots made good early growth and stooled well, except those planted in June and July.

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Superphosphate—112lb. per acre. Seed—30lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
14th April	21 20	21 4	22 32	23 36	24 8	22 32	119	18 37	110
14th May	17 20	18 24	19 44	19 44	19 44	18 59	100	16 52	100
16th June	8 24	7 52	8 0	8 48	9 20	8 8	43	8 20	49

Variety—Gluyas Early. Superphosphate—112lb. per acre. Seed—30lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
14th May	19 44	19 52	20 40	19 52	20 24	20 6	100	16 45	100
16th June	11 44	12 32	13 44	14 56	14 32	13 30	67	10 53	65
15th July	4 32	4 24	4 16	2 56	3 4	3 50	19	4 10	25

The results this year and the average results over the three years the experiment has been conducted, show that it is of advantage to plant the mid-season variety, Nabawa, during April rather than in May. By delaying planting until June, unprofitable returns can be expected.

Both this year's returns and those of the three years' average show also that early maturing varieties are most prolific when sown in May, and that the yields decrease considerably should planting be delayed after this month.

RATE OF SEEDING EXPERIMENT.

The object of this experiment is to determine the most economic rate of seeding with (a) a mid-season free stooling, and (b) an early and sparse stooling variety.

For the former the variety Nabawa, and for the latter the variety Noongaar, were used.

The germination was good on all plots after rain early in June, and owing to the mild climatic conditions which prevailed good growth was made. The general appearance of all crops was very even, and no difference in yield was apparent to the eye.

Planted on 5th May, 1930. Variety—Nabawa. Superphosphate—112lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
22lb.	19 12	17 4	19 20	21 4	17 12	18 16	[illegible]	17 17	[illegible]
42lb.	20 8	17 28	20 16	18 56	17 20	18 50	100	17 14	100
35lb.	17 36	17 36	19 4	19 12	17 44	18 14	97	16 38	96

Planted on 15th May, 1930. Variety—Noongaar. Superphosphate—112lb. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
22lb.	20 40	21 12	21 44	22 4	22 44	22 5	[illegible]	14 57	[illegible]
42lb.	21 44	21 28	22 56	22 0	22 40	22 10	100	14 13	100
35lb.	21 12	21 12	22 0	22 32	20 16	21 20	97	14 14	[illegible]

The average results for the past three years in the early and sparse stooling variety section show very little variation, although the lowest rate has a slight advantage. The variation this year in the rate of 35 lbs. per acre cannot be accounted for.

In the free stooling variety section the results are somewhat similar, and here again the variation in the rate of 35 lbs. per acre cannot be accounted for. It shows, however, the necessity for continuing the experiment for a number of years before arriving at definite conclusions.

RATE OF APPLICATON OF SUPERPHOSPHATE EXPERIMENT.

The object of this experiment is to determine the most economical rate to apply superphosphate to the wheat crop.

In 1929 it was decided to enlarge this experiment so as to ascertain in what proportion a greater rate of superphosphate, up to 300 lbs., would affect the yield, although it was not anticipated that it would be profitable to apply that quantity. It was also decided to include a zero plot having no superphosphate.

In order to preserve the three-plot system this experiment was divided into two sections, in each of which, plots treated with 150 lbs. of superphosphate per acre were regarded as controls. Thus in Section 1 the rates of 300 lbs. and 225 lbs. per acre were compared with the control rate of 150 lbs. per acre, and in Section 2 the rates of no superphosphate and 75 lb. were compared with the control rate.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT, No. 1.

Planted on 7th May, 1930. Variety—Gluyas Early. Seed—30lb per acre.

Rate of Application of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
300lb.	22 56	22 24	21 52	21 4	20 32	21 46	103	13 18	93
150lb.	24 56	22 0	20 32	19 52	18 48	21 14	100	14 21	100
225lb.	22 40	19 4	20 56	21 12	19 28	20 40	97	13 20	93

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT, No. 2.

Planted on 7th May, 1930. Variety—Gluyas Early. Seed—30lb. per acre.

Rate of Application of Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
No superphosphate ...	15 28	14 16	13 12	14 24	13 4	14 5	62	10 17	61
150lb.	22 8	22 8	23 20	21 44	23 44	22 37	100	16 55	100
75lb.	12 8	20 8	20 8	19 20	18 40	18 3	80	14 12	84

The average results for the two years the experiment has been conducted show that increased yields are obtained when superphosphate is applied up to 150 lbs per acre.

With the prevailing prices of wheat, however, the maximum profitable rate of application appears to be reached when 100 to 112 lbs. is applied.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

The object of this experiment is to determine whether, when heavy dressings of superphosphate are applied, it would be profitable to apply part or whole of the amount when cultivating the fallowed land during the late summer and early autumn.

For the purpose of the experiment, three plots were required, and the various rates and times of application of the superphosphate are shown in the accompanying table of results—

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 7th May, 1930. Variety—Gluyas Early. Seed—30lb. per acre.

Time of Application of Superphosphate.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1928–30.	Percentage Yields, 1928–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
150lb. at seeding; 75lb. in March	20 56	18 56	19 12	20 24	21 44	20 14	104	17 7	109
225lb. in March ...	18 24	19 36	19 4	19 28	20 24	19 23	100	15 41	100
75lb. at seeding; 150lb. in March	17 36	15 52	19 12	20 48	20 40	18 50	97	16 14	103

The results for last year, and also the average for the three years, confirm the previous conclusion, viz., the yields can be expected to decrease as the proportion of superphosphate applied at seeding time is decreased.

SEASONAL PLANTING EXPERIMENT.

The objects of the experiment are:—

(1) To ascertain the most suitable month to plant the Mid-season, Early and Very Early maturing varieties of wheat;

(2) To determine the most prolific of each of the above types.

To meet the requirements of this experiment, three sections were needed, viz.:—

(a) Section 1, planted in April, representing Early planting;

(b) Section 2, planted in May, representing Mid-season planting;

(c) Section 3, planted in June, representing Late planting.

Each section planted in its respective month was repeated five times, all plots being eventually harvested for grain.

April Planting.—At the time of planting, the soil was in an excellent and moist condition, and consequently a good germination resulted. Although retarded during the latter part of May all the plots made strong growth during the early winter months. The early maturing variety Noongaar came into ear during July.

SEASONAL PLANTING EXPERIMENT.

April Planting.

Planted on 16th April. Seed—30lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yield per Acre.					Average Yields per acre, 1930.	Average percentage Yields per acre, 1930.	Average percentage Yield per acre 1928–30.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Noongaar ...	Very Early...	1 28	0 56	1 52	1 52	1 28	1 31	10	75
Nabawa ...	Midseason ...	16 0	13 28	16 16	13 36	17 20	15 20	100	100
Gluyas Early	Early ...	10 56	9 44	11 20	8 40	10 56	10 19	67	88
Bencubbin ...	Midseason ...	19 20	20 0	19 28	19 4	21 4	19 47	132	...
Nabawa ...	Midseason ...	14 40	14 48	14 16	15 20	16 0	15 1	100	100

These show in no uncertain manner the inadvisability of planting both the very early and early maturing varieties during April should the resulting crop be intended for grain. It is interesting to notice that very promising results were obtained from the mid-season variety, Bencubbin, which was included in these trials this year for the first time.

May Planting.—Although immediate germination of the seed resulted, the growth of the plants was retarded during the latter part of the month, but with favourable conditions following, the plants made vigorous growth.

May Planting.

Planted on 13th May. Seed—30lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yield per acre, 1930.		Average percentage Yield per acre, 1930.	Average percentage Yield per acre, 1928–30.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Noongaar ...	Very Early	22	56	21	20	20	56	17	28	14	8	19	22	108	113
Nabawa ...	Midseason ...	21	4	18	8	18	24	13	52	*		17	52	100	100
Gluyas Early...	Early ...	21	12	18	8	19	52	16	40	18	8	18	48	105	107
Bencubbin ...	Midseason ...	20	16	20	56	20	24	16	40	17	4	19	4	106	†
Nabawa ...	Midseason ...	19	52	19	4	19	28	14	24	16	48	17	55	100	100
Merredin ...	Early ...	22	8	18	0	17	44	15	12	16	16	17	52	100	89
Carrabin ...	Early ...	18	40	18	16	18	0	12	32	13	12	16	8	100	98
Nabawa ...	Midseason ...	14	32	18	24	16	8	13	44	18	16	16	13	100	100
Geeralying ...	Very Early...	15	28	17	28	17	20	11	52	14	40	15	22	95	101
S.H.J. ...	Early ...	14	16	17	20	14	40	11	28	14	56	14	32	98	88
Nabawa ...	Midseason ...	10	48	18	32	14	16	12	32	17	52	14	48	100	100

* Discarded owing to loss of grain during harvesting. † Bencubbin planted 1930 only.

The average results for the three years the experiment has been conducted show that the highest yields were obtained from the very early maturing variety, Noongaar, and the early variety Gluyas Early, which indicates that they are the most suitable varieties for the May planting. In this year's results the variety Bencubbin is also shown to advantage.

June Planting.—This section suffered most by the scanty rains during spring, which caused the plants to mature under adverse conditions.

June Planting.

Planted on 17th June, 1930. Seed—30lb. per acre. Superphosphate—112lb per acre.

Variety.	Maturity.	Computed Yield per Acre.										Average Yield per acre, 1930.		Average percentage Yield per acre, 1930.	Average percentage Yield per acre, 1928–30.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Noongaar ...	Very Early	17	52	17	12	16	24	18	56	16	8	17	18	163	137
Nabawa ...	Midseason ...	10	40	10	0	10	24	12	56	9	12	10	38	100	100
Gluyas Early...	Early ...	12	48	12	0	12	40	14	24	11	12	12	37	119	117
Bencubbin ...	Midseason ...	13	12	11	20	12	32	15	4	10	32	12	32	131	...
Nabawa ...	Midseason ...	10	0	8	24	9	52	10	40	8	56	9	34	100	100
Merredin ...	Early ...	10	24	8	48	8	56	10	48	8	48	9	33	100	99
Carrabin ...	Early ...	13	36	10	8	10	48	13	44	12	40	12	11	117	...
Nabawa ...	Midseason ...	11	28	8	56	8	56	13	20	9	28	10	26	100	100
Geeralying ...	Very Early...	12	24	8	24	10	32	15	20	12	0	11	44	113	107
S.H.J. ...	Early ...	11	44	8	48	9	44	10	40	8	32	9	54	105	92
Nabawa ...	Midseason ...	11	36	6	48	9	20	10	32	9	4	9	28	100	100

Both this year's results and the average results for the three years show the variety Noongaar to be outstanding, whilst all varieties have yielded better than the control variety Nabawa.

It is quite evident that should it be necessary for the planting season to extend later than the month of May, the most suitable variety to plant is Noongaar.

FIELD EXPERIMENTS WITH WHEAT, 1930.

DAMPAWAH EXPERIMENT FARM.

I. THOMAS, Superintendent of Wheat Farms, and
F. GISHUBL, Farm Manager.

The farm is situated 30 miles East of Perenjori, being formerly a portion of Karara Station, on the fringe of the Lower Murchison.

The soil is a red friable loam, uniform in appearance, and was originally timbered mainly with york gum, giant mallee, karara, and mulga scrub.

This is the first crop grown on this land, which was cleared during 1928 and the early part of 1929. After the burn a large quantity of ashes remained over the whole area. It was ploughed during the winter months (July-August) of 1929, with a disc cultivating plough 3-4 inches deep. Immediately after ploughing it was cultivated with a springtyne implement. The seed was planted with a combined cultivator drill at the rate of 45 lbs. per acre. Superphosphate was applied at 112 lbs. per acre.

The following table shows the rainfall registered at the farm since it was established, together with the number of days on which rain fell during the year under review.

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for Year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1928	*	*	*	*	164	94	238	142	71	34	743	6	156	†
1929	17	220	64	*Nil*	267	234	60	62	18	33	674	120	—	1,095
1930	—	—	93	123	48	404	160	93	22	41	768	31	54	1,069
No. of falls, 1930 ...	—	—	8	9	2	16	12	10	2	3	45	3	3	68

* No records. † Incomplete.

Although the rainfall during the growing period this year was greater than the previous year, the spring rains were somewhat similar, being scanty and insufficient for the crops to mature normally.

After a very dry period from the middle of November, 1929, 93 points of rain were recorded in March, spread over 8 days. Both before and after this rain hot dry weather conditions prevailed.

Prior to the middle of April, when 123 points of rain were recorded, no moisture could be detected in the subsoil as the rain which fell the previous month evaporated very rapidly. The registrations during the month of May were scanty and caused anxiety, as some of the crops already sown were above ground, and showed signs of distress and urgent need of rain.

The continuous and copious rains during June relieved the position, reviving patches of the crop on which the seed had appeared to have malted. There were, however, isolated patches which were affected by the seed malting.

Excellent growing conditions prevailed throughout July and the early part of August, and until the end of the third week of the latter month the crops looked very promising. Unfortunately the seasonable rains terminated abruptly at this time, resulting in the ears of the plants being unable to leave the sheath normally or wilting before reaching maturity. Harvesting of the crops for hay was commenced 16th September, and for grain on 23rd October.

TIME OF SEEDING EXPERIMENT.

The object of this experiment is to determine the most suitable month to plant the wheat crop.

Two varieties of different maturities were used—Nabawa, a midseason, and Gluyas Early, an early maturing variety.

The Nabawa plots were planted mid-April, May, and June, and the Gluyas Early were planted mid-May, June, and July.

The germination of the seed on all plots was satisfactory, and plants made strong growth until the middle of August. From then on, due to the scanty rainfall, all plots showed signs of distress, the plot planted in June with Nabawa failing to produce grain.

The results are tabulated below:—

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Superphosphate—112lb. per acre. Seed—45lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.
	Section 1.	Section 2.	Section. 3.	Section 4.	Section 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
April 15th	4 24	5 20	6 40	6 40	6 24	5 54	180
May 15th	2 32	2 48	3 36	3 44	3 44	3 17	100
June 15th	...	...	...	...	...	...	...

Variety—Gluyas Early. Superphosphate—112lb. per acre. Seed—45lb. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.
	Section 1.	Section 2.	Section. 3.	Section 4.	Section 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
June 15th	3 36	4 0	4 40	4 8	2 48	3 50	40
May 15th	8 32	9 20	10 32	10 8	9 36	9 38	100
July 15th	2 40	2 48	3 12	2 32	2 0	2 38	27

Although these results are for one year only and the yields obtained are low, they emphasise the necessity for planting the different maturing varieties at the correct time.

RATE OF SEEDING EXPERIMENT.

The object of this experiment is to ascertain the most economical rate at which to plant the wheat crop with—

(a) a Midseason, free stooling variety;

(b) an Early, sparse stooling variety.

To meet the requirements of the former, the standard variety, Nabawa, was used, and for the latter, the variety S.H.J.

Each variety, treated as a separate experiment, was planted in different sections.

RATE OF SEEDING EXPERIMENT.

Planted on 21st April, 1930. Variety—Nabawa-Free stooling. Superphosphate—112lb. per acre.

Rate of Seeding.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb.	5 12	8 8	6 24	8 40	8 8	7 18	101	10 38	107
45lb.	4 56	6 0	8 56	8 8	7 44	7 9	100	9 57	100
60lb.	4 40	6 8	8 16	6 24	5 52	6 16	88	9 11	92

Planted on 18th April. Variety—S.H.J. Superphosphate (22%)—105lb. per acre.

Rate of Seeding.	Computed Yields per Acre.					Average Yields per acre, 1929.	Percentage Yields, 1929.
	Section 1.	Section 2.	Section 3.	Section 4.	Section 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
30lb. seed per acre ...	14 15	13 31	14 15	13 53	14 22	14 3	102
45lb. seed per acre ...	14 0	12 40	14 8	13 53	14 8	13 46	100
60lb. seed per acre ...	13 9	12 55	12 11	13 9	14 8	13 6	95

The results of the midseason variety, Nabawa, which is for two years only, confirm the results obtained at the other experiment farms, viz., that no advantage is obtained when the heavier rates of seeding are sown. Unfortunately, owing to misadventure, an accident occurred when planting the plots of the sparse stooling variety, which upset the experiment for this year, and no comparative results were obtained. The results obtained the previous year are tabulated below. These also show that no advantage was gained by heavy rates of seeding.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

This experiment was designed to determine whether when heavy dressings of superphosphate are used it would be profitable to apply part or all of the fertiliser when cultivating the fallowed land during late summer or early autumn, so that seeding operations can be expedited.

TIME OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 5th May, 1930. Variety—Gluyas Early Seed—45lb. per acre. Superphosphate—225lb. per acre.

Time of Application of Superphosphate.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Average Yields per acre, 1929–30.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
150lb. per acre sown in March: 75lb. per acre sown with seed ...	4 40	4 24	5 12	5 20	6 56	5 18	103	13 46	104
225lb. sown in March	4 16	3 52	5 36	5 52	6 16	5 10	100	13 14	100
75lb. in March: 150lb. at seeding	4 40	4 16	5 52	6 32	6 0	5 28	106	14 2	106

The results of this year's trials, and also the results for the two years this experiment has been conducted at this farm, show that the yields are greater when the major portion of the fertiliser is applied at seeding time.

These results are in accord with those obtained from similar experiments conducted at the other experiment farms.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

This experiment is divided into two sections in order to test the effects of applying the following amounts of superphosphate per acre with the wheat crop:—

Section 1—
- No super.
- 150 lbs. per acre (control).
- 120 lbs. per acre.

Section 2—
- 75 lbs. per acre.
- 150 lbs. per acre (control).
- 225 lbs. per acre.

RATE OF SUPERPHOSPHATE EXPERIMENT—No. 1.

Planted on 6th May, 1930. Variety—Gluyas Early. Seed—45lbs./acre

Rate of Application of Superphosphate per acre.	Computed Yield per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
120lb.	8 8	8 48	8 56	7 44	9 28	8 37	106	*
150lb.	7 12	8 32	7 36	8 40	8 48	8 10	100	100
Nil	4 56	5 36	6 0	5 4	5 4	5 20	65	42

* This rate not applied in 1929.

RATE OF SUPERPHOSPHATE EXPERIMENT—No. 2.

Planted on 6th May 1930. Variety—Gluyas Early. Seed—45lb. per acre.

Rate of Application of Superphosphate per acre.	Computed Yield per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.	Percentage Yields, 1929–30.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
75lb.	8 32	7 44	7 28	6 56	9 20	8 0	130	98
150lb.	5 52	5 4	6 8	6 32	7 12	6 10	100	100
225lb.	4 8	4 32	4 48	6 0	5 52	5 4	82	91

The results are for one year only, and no definition conclusion can be arrived at. However, they do not confirm the results obtained from the other Experiment Farms which show that the wheat yields were increased by the heavier applications of superphosphate.

SEASONAL PLANTING EXPERIMENT.

The objects of the experiment are—

(1) To ascertain the most suitable month to plant the Late, Midseason, Early and Very Early maturing varieties of wheat.

(2) To determine the most prolific of each of the above types.

To meet the requirements of this experiment, three sections were needed, viz.:—

(a) Secton 1, planted in April, representing Early planting.

(b) Section 2, planted in May, representing Midseason planting.

(c) Section 3, planted in June, representing Late planting.

Each section planted in its respective month was repeated five times, all plots being eventually harvested for grain.

The standard Midseason variety, Nabawa, was planted in the control plots in all sections.

SEASONAL PLANTING EXPERIMENT.

APRIL PLANTING.

Planted—19th April. Seed—45lb. per acre. Superphosphate—112lb. per acre

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1930.	Percentage Yields, 1930.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
Bencubbin	Midseason ...	6 48	6 40	7 44	6 40	8 8	7 12	108
Nabawa	Midseason ...	5 28	6 24	7 36	6 32	7 28	6 42	100
Carrabin	Early	9 52	9 36	10 0	9 4	10 16	9 46	146
Gluyas Early ...	Early	10 0	10 8	11 4	11 28	11 52	10 54	165
Nabawa	Midseason ...	6 16	6 8	6 24	5 12	9 4	6 37	100
Noongaar	Very Early ...	11 28	11 4	10 32	10 8	11 36	10 58	166

MAY PLANTING.

Planted—15th May. Seed—45lb. per acre. Superphosphate—112lb. per acre.

Variety.	Maturity.	Computed Yields per Aacre.					Average Yields per acre, 1930.	Percentage Yields, 1930.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
Noongaar	Very Early ...	13 52	10 56	11 12	13 20	13 28	12 34	225
Nabawa	Midseason ...	6 0	6 8	4 8	5 44	5 36	5 31	100
S.H.J.	Early	8 24	7 4	7 20	8 0	8 56	7 57	144
Gluyas Early ...	Early	9 12	7 28	8 0	9 20	9 36	8 43	162
Nabawa	Midseason ...	5 28	3 52	5 12	6 32	5 52	5 23	100
Merredin	Early	7 36	6 32	9 52	9 12	9 36	8 34	159
Carrabin	Early	7 44	4 0	6 32	...	...	6 5	116
Nabawa	Midseason ...	7 12	3 20	4 8	5 44	5 52	5 15	100
Bencubbin	Midseason ...	6 48	3 28	5 12	6 16	6 48	5 42	103
Nabawa	Midseason ...	5 44	3 28	5 44	6 24	6 24	5 33	100
Geeralying	Very Early ...	8 32	8 40	10 24	8 32	9 36	9 9	165

In view of the scanty spring rainfall, it is not surprising that the Early and Very Early maturing varieties were outstanding in the April planting, and whilst the Early maturing varieties also yielded better than the control Midseason variety, Nabawa, in the May planting the Very Early variety, Noongaar, was most outstanding.

In the June planting some of the varieties failed to form grain. Very low and unsatisfactory yields were obtained from the remainder, but of these the variety Noongaar again gave the highest yield.

NITROGEN-FIXING BACTERIA FOR LEGUMINOUS PLANTS.

PURE CULTURES OBTAINABLE FROM PLANT PATHOLOGY BRANCH.

H. A. Pittman, B.Sc.Agr.,
Plant Pathologist.

Pure cultures of the nitrogen-fixing bacteria which form nodules on the roots of species of the pea, clover, and bean family (*Leguminosae*), may be obtained on application to the Plant Pathologist, at the prices indicated below.

These bacteria, after forming nodules on the roots of leguminous plants, enable the infected plants to draw directly on the inexhaustible supplies of free nitrogen in the air. Although, in the absence of such nitrogen-fixing bacteria, legumes may make quite satisfactory growth on soils containing abundance of combined-nitrogen, in the form, for instance, of humus compounds, sulphate of ammonia, etc., the full benefit of growing such plants can only be obtained when the appropriate bacteria are present.

A common method of introducing the bacteria onto a new field, or farm, is to inoculate the new area with soil from a field which has previously grown successful crops of the kind under consideration, and on the roots of which abundant nodules have been found. This method is quite satisfactory in most cases, but has the disadvantage of sometimes introducing plant diseases or weed seeds. If attempted it should be carried out preferably during dull weather or late in the afternoon, so as to minimise the harmful effect of sunlight on the bacteria.

In newly-settled areas so far remote from fields already inhabited by the desirable bacteria that the obtaining of suitable soil is not easily, or economically, practicable, the artificial cultures will be found a great boon. They have been used in the past by many farmers in the South-West of this State, and particularly in the Group Settlement areas, with great success.

The bacteria are supplied on agar slopes in test tubes, or in eight-ounce medicine bottles containing about eight times the quantity of the smaller size. To cover cost of materials, glassware, containers, postage, etc., the following small charges are made:—

(a) Test-tube size—1s. 6d.

(b) Medicine bottle size (containing 8 times the quantity in (a))—2s. 6d.

The contents of one tube will inoculate approximately 10 to 15 lbs. of small seed, such as lucerne or subterranean clover, and 20 to 30 lbs. of larger seed, such as peas or soy beans. The bottle size will treat about eight times the quantity of the test-tube size.

DIFFERENT BACTERIA REQUIRED FOR DIFFERENT KINDS OF LEGUMES.

The same strain of bacteria will not inoculate every kind of leguminous plant. Thus trefoils and lucerne are inoculated by the same kind, but the lucerne kind will *not* inoculate clovers or peas.

The bacteria which may be obtained from the Department will inoculate the following groups of legumes. The members of each group are inoculated by the same kind of bacteria, but the plants mentioned in different groups require different bacteria.

Group 1.—Subterranean clover, white Dutch clover, perennial red clover ("cow grass"), Egyptian clover, and all other true clovers (*Trifolium spp.*).

Group 2.—Lucerne, white sweet clover, "King Island Melilot" ("Hexham scent"), medics, trefoils, and all other species of *Medicago* or *Melilotus*.

Group 3.—Garden pea, sweet pea, field pea, all kinds of vetches or tares, broad bean, lentil.

Group 4.—Lupins and serradella.

Group 5.—Soy beans.

DIRECTIONS FOR USING THE PURE CULTURES.

Keep the tubes or bottles covered and in a warm, dark, place until about to be used. The cultures are useful for at least one month after being received. In the cultures the bacteria appear as a whitish slime on the sloping surface of the agar (*i.e.*, the jelly-like material containing bacterial food).

To inoculate the seeds with the cultures.

The seeds should first be piled on a clean surface. Then take *one quarter pint* of fresh skimmed milk for every *tube*, or *one quart* of fresh skimmed milk for every *medium bottle* of culture. In the skim milk dissolve the soluble calcium phosphate supplied with every tube or bottle of culture.

Then transfer the whole of the agar contents of the tube, or bottle, to the skim milk and thoroughly mix the bacterial slime with the milk. When this has been done, pick out the lumps of agar (*i.e.*, the solid, whitish, jelly-like material). Rinse the tube or bottle out into the milk.

Now inoculate the seed by pouring a little of the inoculated milk on the heap of seed, from time to time, and thoroughly mixing until every seed is moistened. The seed should not, however, be made too wet. If any of the inoculated skim milk is left over it could be mixed up with water and spread on a few yards of soil where the seeds are to be planted. On the other hand, if there is not quite enough inoculated milk to thoroughly moisten all the seeds, the vessel which originally contained the inoculated skim milk may be rinsed out with further skim milk, and more added to the heap of seeds until, on repeated mixing, every seeed is uniformly moistened with the inoculated milk.

If sweet skim milk is not available, a commercial brand of powdered skim milk, mixed up with water according to the maker's directions, or even plain water, may be used instead. The milk is better, however, as it causes better adherence of the bacteria to the seed on drying.

It usually takes about one quarter of a pint of milk to every 10 to 15 lbs. of small seeds such as lucerne, or 20 to 30 lbs. of large seed such as peas. The larger the seeds the less culture and skimmed milk required for inoculation, and *vice versa*.

SOWING.

The seeds should be sown as soon as possible after inoculation. If the seeds are too wet to sow they should be allowed to dry in a shady place. Under no circumstances should the cultures or the inoculated seeds be left exposed to the sunlight, as it tends to destroy large numbers of the bacteria. For this reason, also, the seed should be drilled, or, if broadcast, should be at once harrowed in. The inoculated seed should not be sown at the same time as artificial fertilisers, as these may destroy the bacteria.

FARMERS' FIELD TRIALS, 1930.

EXPERIMENTS AT KONDININ.

A. S. WILD, B.Sc. (Agric.), Agricultural Adviser.

Two experiments with wheat were conducted during 1930 on the property of Mr. W. Trembath, Kondinin. They were—

1. A Wheat Variety Trial.
2. A Rate of Superphosphate Trial.

The location of the plots was about one mile distant from Kondinin townsite. They were planted on red morrel soil of a fairly fine texture. The land had been ploughed at the end of July, 1929, with a disc plough to a depth of four inches. During early October it was harrowed and springtyne cultivated, this latter operation being repeated during late October and again in April. The plots, each half acre in area, were subsequently planted on the 15th May with a combined cultivator-drill. Superphosphate (22 per cent.) was applied to the Variety Trial plots at the rate of 112 lbs. per acre, the rate of seed in each case being 45 lbs. per acre. In the Superphosphate Trial the standard early variety, Gluyas Early was planted in all plots.

The monthly rainfalls as recorded at Kondinin during the year, together with the averages, are as follow:—

	Jan.	Feb.	Mar.	Apl.	Useful Rains.							Nov.	Dec.	Total for year
					May.	June.	July.	Aug.	Sep.	Oct.	Total			
Kondinin	...	...	126	181	68	312	364	155	144	32	1,075	7	50	1,439
Average 13 years	40	62	100	105	182	228	219	157	117	82	985	73	38	1,403

Although no rain fell for the first three weeks subsequent to planting, the germination was fair.

The results from both experiments are shown hereunder:—

WHEAT VARIETY TRIAL.

Planted on 15th May. Superphosphate—112lb. 22% per acre. Seed—45lbs. per acre.

Variety.	Maturity.	Computed Yields per Acre.				Average Yields per acre.		Percentage Yields per acre.
		Section 1.		Section 2.				
		bus.	lb.	bus.	lb.	bus.	lb.	%
Nabawa	Midseason ...	24	54	22	8	23	31	72
Gluyas Early (Control)	Early	31	54	33	20	32	37	100
Carrabin	Early	22	58	22	52	22	55	70
S.H.J.	Early	22	18	22	44	22	31	75
Gluyas Early (Control)	Early	30	0	30	22	30	11	100
Noongaar	Very Early ...	...		...		...		...

RATE OF SUPERPHOSPHATE TRIAL.

Planted 16th May. Variety—Gluyas Early. Seed 45lb. per acre.

Rate of Superphosphate per Acre.	Computed Yields per Acre.		Average Yield per acre.	Percentage Yield per acre.
	Section 1.	Section 2.		
	bus. lb.	bus. lb.	bus. lb.	%
150lb	31 40	32 14	31 57	109
75lb. (Control)	30 26	28 8	29 17	100
225lb.	32 50	30 12	31 31	108

In the Variety Trial the control variety, Gluyas Early, shows to decided advantage. Both the varieties Carrabin and S.H.J. proved about equal to the standard midseason variety, Nabawa. Unfortunately the very early variety, Noongaar, lodged and tangled badly, and consequently the yields obtained cannot be taken for comparison.

In the Rate of Superphosphate Trial the rate of 225 lbs. per acre showed no advantage over the 150 lbs. per acre. The results from the trial confirm those conclusions derived from the results of similar experiments conducted at the Experiment Farm and elsewhere, viz.:—

1. The wheat crop is not "burnt off" by the application of the larger quantities of superphosphate.

2. That 75 lbs. of 22 per cent. superphosphate per acre is not sufficient for the most economical results, and therefore it is advisable to apply larger quantities—in years of normal wheat prices up to 150 lbs. per acre.

TIME OF SEEDING EXPERIMENT AT NORTH WALGOOLAN.

H. RUDALL, Field Officer.

The object of this experiment conducted on the property of Mr. W. A. Graham, North Walgoolan, was to demonstrate the necessity for sowing wheats at the correct time, as well as to emphasise the consequences of seeding very late.

For the purpose of the trial two varieties of wheat were used, namely, Nabawa, the standard midseason maturing variety, and Gluyas Early, the standard early maturing variety. Nabawa was planted at intervals of one month, commencing the middle of April, viz., 14th April, 14th May, and 14th June, while Gluyas Early was planted on 14th May, 14th June, and 19th July. The plots, which were each half an acre in area, were duplicated.

The land on which the experiment was planted originally carried a forest of salmon gum, gimlet, and morrel, the soil being a fine red loam which was typical of the soils of the locality. The land was ploughed during the first week in June, 1929, to a depth of 3½ inches with an eight-furrow disc-cultivating plough. In August and September it received a cultivation with a springtyne implement, with harrows attached, and in November a further working with the same implement, without the harrows. It was harrowed in March, and the plots were planted with a combined cultivator-drill. This working produced an excellent seed bed, which was well consolidated, while the mulch was of desired tilth and free of weeds. In addition to the cultivations previously described, the May, June, and July plots received a further springtyne cultivation prior to seeding, to destroy weed growth.

The rainfall recorded up to the end of the growing period is shown in the following table:—

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Total May-Oct.
0	4	126	198	60	395	130	162	130	24	901

The past season has been a good one. During May a dry hot spell was experienced, and the April and May plots were beginning to feel the want of rain when good falls were registered early in June, and, in fact, owing to the heavy June and July rains, the plots planted during these months were sown when the ground was very wet. The lack of finishing rains during October, a feature often experienced in this district, was again felt, 24 points being recorded. In consequence the late sown plots were at a disadvantage.

The results obtained are as hereunder:—

TIME OF SEEDING EXPERIMENT.

Nabawa—Midseason Variety.

Seed—45lb. per acre. Superphosphate—85lb. per acre.

Planted.	Computed Yield per Acre.		Average Yield per acre.	Average Percentage Yield per acre.
	Section 1.	Section 2.		
	bus. lb.	bus. lb.	bus. lb.	%
April 14th	24 0	25 40	24 50	127
May 14th	19 40	19 20	19 30	100
June 14th	19 0	18 50	18 55	97

Gluyas Early—Early Variety.

Seed—45lb. per acre. Superphosphate—85lb. per acre.

Planted.	Computed Yield per Acre.		Average Yield per acre.	Average percentage Yield per acre.
	Section 1.	Section 2.		
	bus. lb.	bus. lb.	bus. lb.	%
May 14th	24 20	24 20	24 30	100
June 14th	19 0	18 20	18 40	76
July 19th	8 0	7 40	7 50	32

Although this experiment has been conducted on this property for one year only, the data obtained shows a close uniformity with the results from similar trials in the Merredin Experiment Farm, which is located some thirty odd miles further West. The figures, in themselves, are a convincing argument, and they illustrate how very important it is to sow the right variety at its correct seeding period. Just as it spells failure to seed very late, so is it courting trouble by going to the other extreme and planting too early, with the result that such troubles as frost, septoria, etc., may either destroy the whole crop or considerably diminish the yield. So as to counteract this possible tendency of sowing too early, the following seeding calendar for the Walgoolan area is recommended:—

SEEDING CALENDAR.

WALGOOLAN AREA.

Variety.	Time to Plant.
Late maturing vatieties, *e.g.*, Yandilla King	Too late for district.
Midseason maturing varieties, *e.g*, Nabawa	April 15th to May 7th
Early maturing varieties, *e.g.*, Gluyas Early	May 1st to May 21st
Very Early varieties, *e.g.*, Noongaar	May 21st to May 31st

TIME OF SEEDING EXPERIMENT AT SCADDAN.

G. L. Throssell, Dipl. Agric., Agricultural Adviser.

In response to a request from the Scaddan Settlers' Association, the Department of Agriculture this year conducted a Time of Seeding Experiment on the property of Messrs. Grigg Bros., Scaddan.

The object of the experiment was to determine the most suitable time to plant the wheat crop, as well as to provide an ocular demonstration of the folly of seeding too late. Because of the divergent views on the subject held by many settlers in this area, an experiment of this nature was necessary to emphasise the Departmental recommendations.

Three varieties were used, the late maturing variety Yandilla King being sown in April and May; the midseason variety, Nabawa, in April, May and June; and the early variety, Gluyas Early, in May, June and July. The plots, which were each half an acre in area, were duplicated. It was intended that the April plots should be sown on 15th April, but owing to rain, planting was delayed until the 24th.

The land on which the experiment was planted was a heavy clay soil which originally carried a dense growth of mallee, and which was typical of the soil of the Scaddan district. It was rolled and burnt in 1920, and had been cropped four times with wheat prior to 1930. This paddock is worked on a three-year rotation—fallow, wheat, pasture the previous wheat crop being sown on fallow in 1927. For this year's crop it was ploughed with a disc cultivating plough in July, 1929, to a depth of 3-4 inches, worked across with the same implement in September, and received a springtyne cultivation in January and March. The heavy rains which fell after the March working, necessitated two further cultivations with the same implement prior to seeding the April plots.

The rainfall recorded on the farm during the year was as follows:—

Year.	Jan.	Feb.	Mar.	Apl.	Useful Rains.							Nov.	Total Jan.-Nov.
					May.	June.	July.	Aug.	Sept.	Oct.	Total		
1930 ...	2	...	325	333	289	150	80	251	73	30	873	20	1,553
Wet days ...	1	...	11	6	9	10	7	15	4	5	50	4	72

It will be noticed that the season opened in a very promising manner, while there was a falling off in the rainfall towards the end of the growing period. During October and November the weather conditions were favourable for the development of rust and the variety Yandilla King was very badly attacked, causing a considerably decreased yield and resulting in pinched grain. Nabawa and Gluyas Early were also affected, but only very slightly.

The disease Takeall was prevalent in the Yandilla King and early sown Nabawa plots, while the later sown Nabawa and the Gluyas Early plots were very free of the disease. This confirms one of the methods advocated by the Department of Agriculture for the control of this disease, namely, that where paddocks are known to be infected with Takeall it is advisable to delay seeding until the early seeding rains have fallen, thus permitting a further cultivation which would assist to destroy the spores (or "seeds") of the disease, which have germinated. It must be remembered, however, that if seeding is delayed the variety planted must be of the correct maturity for the time that seeding takes place.

The results obtained are set out below:—

TIME OF SEEDING EXPERIMENT.

Yandilla King—Late Variety.

Seed—45lb. per acre. Superphosphate—112lb. per acre.

Planted.	Computed Yields per Acre.				Average Yields per acre.		Average percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
April 24th	10	8	8	52	9	30	125
May 14th	7	22	7	52	7	37	100

Nabawa—Midseason Variety

Seed—45lb. per acre. Superphosphate—112lb. per acre.

Planted.	Computed Yield per Acre.				Average Yields per acre.		Average Percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
April 24	21	22	19	26	20	24	121
May 14th	17	42	16	8	16	55	100
June 13th	9	44	9	30	9	37	57

Gluyas Early—Early Variety.

Seed—45lb. per acre. Superphosphate—112lb. per acre.

Planted.	Computed Yields per Acre.				Average Yields per acre.		Average Percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
May 14th	19	20	18	52	19	6	100
June 13th	12	6	10	48	11	27	60
July 13th	5	46	6	0	5	53	31

Although this experiment has been conducted for one year only, it confirms in no uncertain manner the results of the experiments and experience obtained at the Salmon Gums Experiment Farm. From these results the necessity for sowing the right variety, at its correct seeding period, and also the consequences of seeding too late, are apparent to all.

For the information of the Scaddan-Treslove settlers, the Departmental Seeding Calendar for this area is given below:—

Late Maturing Varieties, *e.g.*, Yandilla King, April 1st to April 21st.

Midseason Maturing Varieties, e.g., Nabawa, April 21st to May 14th.

Early Maturing Varieties, *e.g.*, Gluyas Early, May 10th to May 31st.

TIME OF SEEDING EXPERIMENT AT RAVENSTHORPE

G. L. THROSSELL, Dipl. Agric., Agricultural Adviser.

The object of this experiment was to determine the most suitable time to plant the wheat crop. After an inspection of the available fallow in the district, a site was selected on the property of Mr. F. E. Daw, situated about 3-4 miles east of Ravensthorpe on the Kuliba-Hopetoun road.

For the purpose of the experiment two varieties were used, namely, Nabawa, the standard mid-season variety, which was planted on April 11th, May 15th, and June 16th, and Gluyas Early, the standard early variety, planted on May 15th, June 16th, and July 17th. The plots, which were each a quarter of an acre in area, were duplicated.

The soil on which the experiment was planted was a sandy clay loam, originally carrying mallee. It was ploughed 4 inches deep with a mouldboard plough in July, 1929, springtyne cultivated in November, disc cultivated in March, and springtyne cultivated on 9th April. In addition, the May, June and July plots received a further cultivation prior to seeding.

The rainfall recorded at Ravensthorpe during the year was as follows:—

Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
				May.	June.	July.	Aug.	Sept.	Oct.	Total.			
.	7	346	173	377	163	149	135	76	55	955	42	15	1,538

The land was in splendid order as a result of the cultivation after the early rains. All plots germinated well, the dates of germination being as follows:—April plots, 20th April; May plots, 20th May; June plots, 21st June; and July plots on 26th July. A very heavy downpour of rain was experienced on 29th May which washed the surface of the May sown Gluyas Early plots, and one of the April sown Nabawa plots. Good rains were experienced during the winter months and the plots made splendid growth. However, the absence of late rains placed the late sown plots at a disadvantage, as would be expected.

The results obtained are shown in the following table:—

TIME OF SEEDING EXPERIMENT.

Nabawa—Midseason Variety.

Seed—45lb. per acre. Superphosphate—120lb. per acre.

Planted.	Computed Yields per Acre.				Average Yield per acre, 1930.		Average percentage Yield per acre, 1930.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
April 11th	26	36	25	16	25	56	198
May 15th	14	8	12	4	13	6	100
June 16th	9	48	8	32	9	10	70

Gluyas Early—Early Variety.

Seed—45lb. per acre. Superphosphate—120lb. per acre.

Planted.	Computed Yields per Acre.				Average Yield per acre, 1930.		Average percentage Yield per acre, 1930.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
May 15th	16	24	14	40	15	32	100
June 16th	10	40	9	24	10	2	65
July 17th	2	28	2	16	2	22	15

Although the early sown plots were interfered with by the heavy May rains, the results, which are for one year only, indicate how the yield is reduced by seeding after the end of May. While they emphasise the folly of seeding late, I would point out that it is unwise to go to the other extreme and plant too early. In order to assist the settlers in the Ravensthorpe area in this direction, the following seeding calendar is recommended:—

SEEDING CALENDAR—RAVENSTHORPE DISTRICT.

Dates of Planting.

	North of Ravensthorpe.	Ravensthorpe and immediately South.	Kundip and Kuliba.
Late Maturing Varieties, *e.g.*, Yandilla King	Too late	April 1 to 15	April 15 to 21
Midseason Maturing Varieties, *e.g.*, Nabawa	April 15 to May 7	April 15 to May 7	April 21 to May 15
Early Maturing Varieties, *e.g.*, Gluyas Early	May 1 to 21	May 1 to 21	May 10 to 31
Very Early Maturing Varieties, *e.g.*, Noongaar	May 21 to 31	May 21 to 31	...

TIME OF SEEDING EXPERIMENT AT NORTH BENCUBBIN.

T. LUTZ, B.Sc. (Agric.), Agricultural Adviser.

An experiment of this nature was conducted on the property of Messrs. Langley Bros., North Bencubbin, at the request of the Warkutting Progress Association.

For the purpose of the experiment, which was designed to demonstrate the necessity for timely seeding, two varieties were used, viz., Nabawa, the standard mid-season maturing variety, which was planted at monthly intervals April 16th, May 15th, and June 14th; and the standard early variety Gluyas Early, planted on May 15th, June 14th, and July 16th. The plots were each half acre in area and were duplicated.

The land on which the experiment was conducted originally carried salmon gum, gimlet, mallee and tea-tree. It was ploughed in July with a disc implement, springtyne cultivated in August and prior to seeding the plots. In addition, the May, June, and July plots received a further cultivation prior to seeding to control weed growth.

The rainfall recorded at North Bencubbin was as follows:—

Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
				May.	June.	July.	Aug.	Sept.	Oct.	Total.			
..	6	173	241	47	480	169	164	64	15	939	...	62	1,421

After experiencing a very dry month during May, when it was noted that germination was retarded, good winter rains were recorded. The season was a splendid one until September, when only light spring rains were recorded, affecting all plots adversely, but particularly the late sown ones.

The results obtained are as follow:—

TIME OF SEEDING EXPERIMENT.

Midseason Variety—Nabawa.

Seed—45lb. per acre. Superphosphate—75lb. per acre.

Planted.	Computed Yield per Acre.				Average Yields per acre.		Average Percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
April 16th	15	29	15	31	15	30	102
May 15th	15	18	15	0	15	9	100
June 14th	7	13	9	3	8	8	54

Early Variety—Gluyas Early.

Seed—45lb. per acre. Superphosphate—75lb. per acre.

Planted.	Computed Yields per Acre.				Average Yields per acre.		Average percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
May 15th	17	45	21	32	19	38	100
June 14th	12	2	15	14	13	38	69
July 16th	8	42	8	49	8	45	45

The results are for one year only, so that no definite conclusions can be arrived at. They agree, however, with similar experiments and show that May is the best month in which to plant the wheat crop.

TIME OF SEEDING EXPERIMENT AT BENCUBBIN.

T. LUTZ, B.Sc. (Agric.), Agricultural Adviser.

Three experiments were planted on the property of Mr. B. W. G. Hopwood, Bencubbin, last season, viz., two Time of Seeding Experiments and a Wheat Variety Trial.

The land on which the experiments were planted originally carried mallee, jam, and teatree scrub.

The plots, which were planted on well prepared fallow, were duplicated and were each half an acre in area.

The rainfall recorded at Bencubbin during the year was as follows:—

Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
				May.	June.	July.	Aug.	Sept.	Oct.	Total.			
..	21	17	229	58	447	193	128	74	18	918	2	31	1,211

The early sown plots germinated well after the good April rains, but on account of the dry period experienced during May, the May sown plots did not germinate until June 3rd. The heavy winter rains and the mild season were ideal for the growing crops, and although good yields were obtained, the light spring rains adversely affected the yields.

For the purposes of the trial two varieties were used, namely, Nabawa, the standard mid-season maturing variety, and Gluyas Early, the standard early maturing variety. The varieties were planted at intervals of one month, viz., Nabawa, April 15th, May 15th, and June 15th; and Gluyas Early, May 15th and June 15th. The July plots with this variety could not be planted on account of the boggy condition of the ground.

The results obtained are as hereunder:—

Midseason Variety—Nabawa.

Seed—45lbs. per acre. Superphosphate—112lbs. per acre.

Planted.	Computed Yields per Acre.		Average Yields per acre.	Percentage Yields per acre.
	Section 1.	Section 2.		
	bush. lbs.	bush. lbs.	bush. lbs.	per cent.
April 15th	17 4	17 16	17 10	81
May 15th	20 6	22 28	21 17	100
June 15th	16 42	17 0	16 51	79

Early Variety—Gluyas Early.

Seed—45lbs. per acre. Superphosphate—112lbs. per acre.

Planted.	Computed Yields per Acre.				Average Yields per acre.		Percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
May 15th	22	26	21	52	22	9	100
June 15th	19	10	18	12	18	41	84

As this experiment has been conducted for one year only, no definite conclusion can be arrived at. However, the results indicate that May is the best month in which to plant the crop.

The following seeding calendar is recommended for this area:—

SEEDING CALENDAR.

BENCUBBIN DISTRICT.

Variety.	Time to Plant.
Late Maturing Varieties, *e.g.*, Yandilla King ...	Too late for District.
Midseason Maturing Varieties, *e.g.*, Nabawa	April 15th to May 7th.
Early Maturing Varieties, *e.g.*, Gluyas Early	May 1st to May 31st
Very Early Maturing Varieties, *e.g.*, Noongaar ...	May 21st to May 31st

WHEAT VARIETY TRIAL.

In addition to a Time of Seeding Trial, a Wheat Variety Trial was conducted with the mid-season varieties Nabawa and Bencubbin, and the early variety Gluyas Early as control.

The results are shown in the following table:—

Planted 13th May. Seed—45lb. per acre. Superphosphate—112lb. per acre.

Variety.	Computed Yields per Acre.				Average Yields per acre.		Average percentage Yields per acre.
	Section 1.		Section 2.				
	bus.	lb.	bus.	lb.	bus.	lb.	%
Gluyas Early	20	18	19	5	20	5	100
Bencubbin	26	2	25	24	25	43	128
Nabawa	22	4	18	34	20	19	105
Gluyas Early	19	52	18	52	19	22	100

Good yields were obtained from all varieties, but as the trial has been conducted for one year only, no conclusions can be arrived at. The variety Bencubbin, however, shows to advantage.

FEEDING WHEAT TO PIGS.

G. K. Baron-Hay,
Superintendent of Dairying.

Enquiries are being received daily as to the profit likely to be derived from the feeding of wheat to pigs, and whether, with wheat alone available as a food, it is possible to rear pigs suitable for the bacon trade.

A visit to the metropolitan market at Midland Junction will convince the observer that many excellent bacon pigs are now being forwarded from wheat-growing areas, but it also will be obvious that large numbers are being incorrectly fed, with disappointing results to the owner when sold.

It is hoped that the following notes will be of value to those intending to market a portion of their crop of wheat in the form of pork or bacon.

MAKING A START.

While undoubtedly more profit is made from feeding pigs bred on the farm, this will be impossible in the initial stages, owing to the delay necessary for breeding and weaning the prospective bacon pigs.

A start will have to be made with store pigs, probably bought in the market.

The chief drawback to purchasing store pigs is the difficulty of obtaining a sufficient number of the right type and of even weights.

A long bodied pig, with long deep middle, heavy ham and a light shoulder is the type to purchase, and should be relatively lean, otherwise there may be a danger of fattening when too small.

The size of pig to buy for fattening will depend to a great extent on the cost of freight and cartage to and from market. The greater these costs the younger should store pigs be purchased, and fed to as heavy a weight as practicable, in order to spread this cost over as many bushels of feed wheat as possible.

There is a limit, however, to the weight at which young pigs may be purchased for feeding with wheat. Experience has shown that weaners cannot be purchased safely and reared on wheat as a basal ration. It is inadvisable to purchase pigs weighing less than 80 lbs. (live weight) for fattening purposes.

BREEDING.

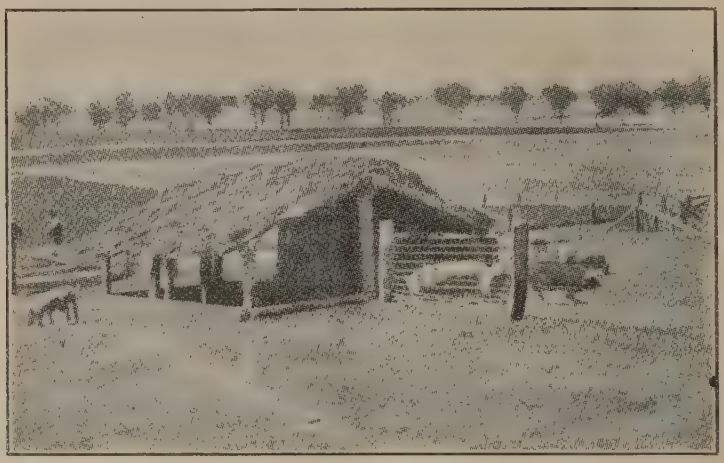
The aim should be to breed one's own baconers as soon as possible. For this purpose good high grade sows of the Berkshire breed, or Berkshire-Tamworth cross may be bought at almost any large pig sale to-day. These should show good length and depth, fine skin free from wrinkles. They should be fine in bone and have at least 12 well placed teats.

It is essential to obtain, from a reputable breeder, a pedigreed boar for mating with these sows, and if possible from a large litter. This boar should show all the essential points of a bacon pig. See article in "Journal of Agriculture," March, 1930—"The Bacon Pig," Bulletin 296.

The pure bred Berkshire boar is recommended for general "grading-up" purposes.

SHELTER AND WATER SUPPLY.

On Wheat Belt areas it is essential that ample shade should be provided. Cheap temporary shelters may be made from saplings, the roof being of straw or boughs, and approximately 4 feet from the ground. These may be burned without serious loss, should they for any reason become foul.



A cheap, effective shelter on a wheat farm.

A plentiful supply of clean water is also essential. The writer has in mind where a farmer lost several valuable sows through allowing them to drink water from a clay hole, the clay flocculating in the intestines, causing impaction. Water should be available from troughs only.

FEEDING WHEAT.

Wheat alone is not a complete ration for growing pigs, being low in proteins for flesh building, and also lacking in mineral matter for skeleton formation. This deficiency may be made up in two ways:—

(1) By the addition of skim milk to the ration.

(2) By the addition of meatmeal and bonemeal.

Skim Milk.—A large quantity of skim milk is not necessary to provide the protein required to form a complete ration. One gallon to each 4 lbs. of grain feed is sufficient, and also economises in grain.

Skim milk, if available, should be reserved for weaner pigs.

Meatmeal and Bonemeal. -Where skim milk is not obtainable, meatmeal must be fed in the proportion of approximately 8 per cent. of the grain ration. In addition, bonemeal should form 2 per cent. of the ration.

WHOLE OR CRUSHED WHEAT.

Wheat should be crushed or cracked before being fed, and provided this is carried out, there is no need to soak the wheat.

Uncrushed wheat, however, shows a loss as high as 20 per cent. over crushed wheat, through not being digested.

The cost of feeding can be considerably reduced by using self-feeders, allowing the pigs to have free access to both wheat and meatmeal. It has been found in numerous feeding tests that self-feeders are economical in feeding, and that the pigs consume meatmeal at approximately 8 per cent. of the total grain consumption.

COST OF FEED CONSUMED.

The results of fifteen months' feeding on the Rutherglen Experiment Farm, Victoria, concluded last November, have shown that, on the rations mentioned above, allowing the pigs to consume all they desire.

The average grain per pig per day = 1.35 lbs.

Feed per pig per day = 3.47 lbs. wheat and .28 lbs. meatmeal.

Feed per lb. gain in weight = 2.57 lbs. wheat and .20 lbs. meatmeal.

Pigs Pasturing.

The following table will indicate on these figures that the feeding of wheat to pigs, even at present prices of bacon, is profitable:

Pig purchased at 80 lbs., and fattened to 180 lbs. live weight.

	£	s.	d.
Purchase price 80 lb. pig (live weight) ..	1	5	0
Meatmeal consumed, 20 lbs. at 1.87d. ..	0	3	1½
Bonemeal, 4 lbs.	0	1	0
	1	9	1½
Present day value	2	10	0
Value of wheat fed	£1	0	10½

or 3s. 7d. per bushel.

The nett return will vary depending on the location of the farm from the market, but costs can be accurately worked out for any locality, using the above figures for food consumed.

JUNIOR FIELD TRIALS WITH WHEAT.

MERREDIN EXPERIMENT FARM, 1930.

E. J. Limbourn,
Cereal Breeder.

These trials were planted on 19th May in a plot adjoining the Test Rows, the method of planting being similar to previous years.

Each variety was sown down two tubes of the drill, a drill width containing five varieties with the control variety Gluyas Early on either side.

The length of the plots, as planted, was 10 chains, which was later subdivided into 10 sections of 87 links with a division of four links between each section, the balance of the plot forming a headland.

Three of these sections were harvested as hay, six for grain, and one was left standing so that information regarding the strength of straw and ability of the different varieties to hold their grain could be obtained.

Germination was somewhat delayed by dry conditions at the time, there being practically no rain from 9th May until 1st June. This dry spell following good rains during April had enabled the plot to be well cleaned from weeds, and, except for lack of moisture, the soil was in splendid condition for planting. Very little malting of the seed occurred, and a good germination was obtained after the early June rains.

The trial consisted of eight new crossbred wheats with Gluyas Early as the control variety, Nabawa and Carrabin being also included for comparison.

Weather conditions were ideal for growth, the plants stooling out rather than running up to straw, although the general height of straw was above the average. Ears were all well formed and mostly filled three grains to the spikelet, grain being fairly plump and of a good colour.

The crossbred varieties of strong milling qualities gave disappointing yields compared with Gluyas Early or Nabawa, the higher yields being obtained with the more starchy-grained types.

One or two of the strong milling crossbreds continue to give rather better yields than Carrabin, and for that reason a milling test with these crossbreds should be of interest. In the 1929 milling test (Nabawa x Carrabin) M. 26 showed a decided improvement over Nabawa, although not equal in strength of flour to Carrabin.

Except for a few patches of Take-all, mainly in Section A, the planting was very free from disease.

Flag Smut was found throughout the Gluyas Early controls, the loss from this disease being possibly one per cent. All other varieties were entirely free from infection by this disease, which goes to show that the method of selecting new varieties for resistance to this disease is quite satisfactory. No definite sign of resistance to Take-all could be noticed, the diseases being fairly general throughout the experiment, all varieties being affected.

Rust appeared in a mild form during October, all varieties being attacked, but no apparent effect on yield or quality of the grain could be noticed.

Special note was made of the standing quality of the straw, a portion of the planting being left standing until towards the end of December Gluyas Early lodged rather badly in places, and the selection from Minflor P. 1753—broke down after heavy rain in December, but stood fairly well up to that time. (Nabawa x Bunyip, M. 14, also broke down somewhat, the straw being very brittle. The other varieties were all decidedly better than Gluyas Early, odd straws breaking down only.

JUNIOR FIELD TRIALS—WHEAT—GRAIN YIELDS. 1930.

Variety.	Reg. No.	Average height.	Sec. A.	Sec. B.	Sec. C.	Sec. D.	Sec. E.	Total Yield.	Average Yield per section.	Comparative percentage Yield.
		inches.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	%
Gluyas Early	P 159	46	94·125	95·750	87·250	91·125	84·125	452·375	90·475	100
(D.A.C. 4179 × Nabawa)	C84	46	99·750	82·750	76·625	83·000	83·250	395·375	79·075	86
(Federation × Carrabin) ...	M 37	45	71·250	76·250	61·625	64·125	58·250	331·500	66·300	72
Nabawa	P 1432	44	79·250	74·000	82·000	79·250	77·500	392·000	78·400	85
(Nabawa × Carrabin) ...	M 26	45	59·250	62·750	69·000	69·000	72·750	312·750	62·550	68
(Nabawa × Carrabin) ...	M 35	48	56·125	58·125	67·000	68·750	65·625	315·625	63·125	69
Gluyas Early	P 159	47	91·750	89·000	100·750	95·500	92·725	469·750	93·950	100
Gluyas Early	P 159	47	84·125	91·000	101·625	93·500	98·375	468·625	93·725	100
Minflor—Selection from ...	P 1753	42	57·250	62·750	69·250	63·500	67·500	319·750	63·950	70
(Florence × Carrabin) ...	M 24	47	43·500	45·375	50·875	51·000	57·250	248·000	49·600	55
Carrabin	P 1437	47	38·875	63·000	69·250	63·375	42·000	276·500	55·300	61
(Nabawa × Gluyas Early)	M 20	47	112·125	113·000	112·625	111·250	109·375	558·375	111·675	112
(Nabawa × Bunyip) ...	M 14	47	63·500	83·750	100·500	77·875	90·500	416·125	83·225	91
Gluyas Early	P 159	47	79·375	93·375	91·750	88·875	89·250	442·625	88·525	100

JUNIOR FIELD TRIAL—WHEAT, 1930—SUMMARY OF RESULTS.

Variety.	Reg. No.	Season of Maturity.	Average Height.	Comparative percentage Yield.
			inches.	%
(Nabawa × Gluyas Early)	M 20	Early	47	112
Gluyas Early	P 159	Early	47	100
(Nabawa × Bunyip)	M 14	Very Early	47	91
(D.A.C. 4179 × Nabawa)	C 84	Midseason	46	86
Nabawa	P 1432	Midseason	44	85
(Federation × Carrabin)	M 37	Early	45	72
A selection from "Minflor"	P 1753	Very Early	42	70
(Nabawa × Carrabin)	M 35	Early	48	69
(Nabawa × Carrabin)	M 26	Midseason	45	68
Carrabin	P 1437	Early	47	61
Florence × Carrabin	M 24	Early	47	55

The Yield of "Gluyas Early" as shown above, is computed from the average yield of all four control plots.

COMPARATIVE PERCENTAGE RESULTS IN PREVIOUS SEASONS—GLUYAS EARLY = 100 %.

Variety.	Reg. No.	Comparative percentage yields.				Average.
		1927.	1928.	1929.	1930.	
		%	%	%	%	%
Carrabin	P 1437	...	83	77	61	74
Nabawa	P 1432	...	97	94	85	92
(Nabawa × Gluyas Early)	M 20	...	122	107	112	114
(Nabawa × Bunyip)	M 14	79	86	91	91	87
(D.A.C. 4179 × Nabawa)	C 84	...	...	97	86	91
(Nabawa × Carrabin)...	M 35	...	...	94	69	81
(Nabawa × Carrabin)...	M 26	...	93	87	68	83
Florence × Carrabin	M 24	83	84	...	55	74

The rainfall for the year was as follows, the averages being for the past 19 years, from 1912-1930.

	Jan.	Feb.	Mar.	Useful Rains. Apl.	May.	June	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for year.
1930 ..	...	1	231	186	40	363	137	184	65	34	1,009	1	41	1,333
Average 1912-30...	55	56	125	79	130	125	188	140	93	75	821	44	54	1,234

NOTES ON THE NEW VARIETIES.

(*Nabawa x Bunyip*), M. 14.—Owing to the brittle nature of the straw and its general similarity to the parent type, Bunyip, it has been decided to discard this crossbred. It shows no definite improvement over Bunyip, and did not yield nearly as well as the variety Noongaar in the Seasonal Variety Field Trials.

(*Nabawa x Gluyas Early*) M. 20.—An early variety, resistant to Flag Smut, that is giving consistently higher yields than Gluyas Early. In the May planting of the Seasonal Variety Trial it gave an average increase of yield over Gluyas Early of three per cent. over the five plots harvested. It has a semi-solid straw like Gluyas Early, but being stouter and less whip-like, it has not the same tendency to lodge. Its resistance to Flag Smut should make it a valuable variety to combat the extension of that disease which is increasing rapidly in this State, and which in the Eastern States is considered one of the worst diseases that affect wheat crops.

(*Florence x Carrabin*) M. 24.—Although of strong milling quality and resistant to Flag Smut, its low yield does not warrant a further trial.

(*Nabawa x Carrabin*) M. 26.—This is a strong milling variety, resistant to Flag Smut, giving a rather better yield than Carrabin.

(*Nabawa x Carrabin*) M. 35.—A selection from the same cross as M. 26. Resistance to Flag Smut, and of strong milling quality. It makes taller growth, and matures earlier than M. 26, and for the two years under test has given a slightly increased yield.

(*Federation x Carrabin*) M. 37.—This is a doubtful variety at present, being rather irregular in growth and very tough to thresh. It gave the best yield of the strong milling varieties, and may improve under selection. It is also resistant to Flag Smut.

A Selection from "Minflor." P. 1753.—This is an early maturing strain selected from the variety "Minflor," received from Mr. H. Pye of the Dookie Agricultural College, Victoria. Being short in the straw it was thought that it would prove useful to overcome damage by strong winds. The straw, however, is very brittle, and broke down rather badly. There is a late maturing strain of this variety that has the same brittle straw. Both strains are very resistant to both Flag Smut and Bunt, but show possible susceptibility to Rust.

(*D.A.C. 4179 x Nabawa*) C. 84.—It is doubtful whether this is any improvement over "Nabawa."

LUCERNE FOR THE SOUTH-WEST.

M. CULLITY, B.Sc.(Agr.),
Agricultural Adviser.

Lucerne is one of our oldest cultivated crops, having been used by man for more than 2,000 years. It belongs to that family of plants known as the *Leguminosae*, various members of which have been largely used by farmers in the past century in their rotations, they having observed that crops following on legumes seemed to grow much better. They believed this result was due to some peculiarity of legumes, but it was not until the last thirty years that this peculiarity was explained. The association with certain bacteria in the soil enables legumes to draw one of the principal plant foods, not from the soil, but from the air. The plant and bacteria exist together for their mutual benefit in a state of symbiosis, the bacteria living on plant juices or substances drawn from those juices, while at the same time making available to the plant stores of easily assimilable nitrogen which has been drawn from the air, where it exists in enormous quantities in a form useless to the plant. The indication of the presence of these bacteria may be easily seen by examining the root system of a species of this family of plants for small growths known as nodules.

Lucerne, however, does not often figure in an ordinary rotation, so the beneficial effects to crops following it are not often seen. What is more often apparent, however, is the comparatively poor growth of lucerne due to an insufficient number of the lucerne bacteria being present. This can be remedied by the farmer by topdressing the area with a small quantity of soil taken from an area where lucerne is growing strongly. However, it is always better to take the precaution to see that bacteria are present when sowing. This may be done in three different ways—

(1) by topdressing the area to be sown with a quantity of soil as above; or

(2) by mixing the seed to be sown with a few pounds of soil as above, dried, but not heated. (The drying of this soil should be done in a shaded place, as sunlight will kill the organisms. Sowing should then be carried out in the afternoon to prevent the injurious action of the sun); or

(3) pure cultures of the organism may be obtained from the Plant Pathology Branch of the Department of Agriculture at a small charge to cover postage. These are shaken up in skim milk or very thin glue, and the seed mixed with it. It is dried sufficiently for sowing, which, as with the soil dusting method, should be carried out in the afternoon.

SOILS.

Lucerne thrives in a variety of soils, and, from the experience in the newer districts in the South-West, it would appear that with attention, payable results may be obtained off almost any soil. The best condition is a deep free-working soil, with free water several feet below ground level, but in the majority of cases where a good permeable subsoil is present, enabling the long roots to penetrate, it will be found that lucerne will thrive. Even in cases where on examination of the subsoil it would appear to be too stiff for roots to penetrate, payable results have been obtained.

One absolute essential to success is drainage, as lucerne will not grow in sour soil. Patches are often seen in lucerne plots where weeds, etc., are prolific, and

the lucerne appears to have died out. These on examination usually are depressions where water lies. The benefit of lime to lucerne is often attributed to its sweetening effect rather than any mechanical or manuring effect.

PREPARATION OF SOIL.

Lucerne being a deep rooter, it is necessary that the preparation of the soil be to such a depth as to allow the young roots to get as far down as possible in a short time. The depth of ploughing, however, must be controlled by the type of soil. If the soil is only four inches, it would be a mistake to plough six inches and bring a portion of the subsoil to the surface. Weeds are a big problem in establishing a new field, as these will often kill or choke out the young lucerne plants which are slow growers. It is preferable to plough the land some time before it is required to sow, and to destroy the weed growth by frequent cultivation. Where autumn planting is carried out this cannot be done as the germination of the weeds and the lucerne will take place about the same time. To control this, it is necessary to plant the lucerne in drills so that cultivation may be given between the rows. Where possible it is preferable to sow the ground that is to be laid down to lucerne with some clearing crop, oats, etc., but preferably potatoes where it can be done. This crop has the advantage of opening up the soil to a good depth, leaving a large residue of fertiliser behind, and leaving the ground free from weeds.

The land should be worked down to a good seed bed, with the disc cultivator or harrows. Often before sowing, a final very shallow ploughing is given, followed by the harrows and the roller to give a fine, firm seed bed. The rolling is necessary, because the lucerne seed being small requires to be well packed in the soil, otherwise malting may occur.

Time of sowing will vary with the conditions. With good moisture-holding soils spring planting is better, as this gives an opportunity of cultivating for weed destruction throughout the autumn and winter. On other locations, however, as on the hillside slopes of Manjimup, for instance, it is often advisable to sow in the early autumn in drills. The lucerne will germinate and make fair growth before the winter sets in. The plants then generally are in an excellent condition for fast growth during the ensuing spring, for as the moisture recedes in the soil the young tap roots are in a position to be able to follow it down.

On the flats or in the gullies of that district sowing may be held over until the spring, providing the area is worked up early in the autumn, and has been kept clean.

SOWING.

The quantity of seed to sow will vary according to whether the crop is sown in drills or broadcast. Where drilled six to eight lbs. seed will be found sufficient. Where broadcast 12 to 15 lbs. will be required to give a good result. Both methods have their advocates and good results may be obtained by either method.

Where weed growth is bad or summer cultivation is necessary, it will be found that sowing in drills will enable weed control and moisture conservation to be carried out much more easily. However, where the ground is clean and sufficient summer moisture is not a problem, broadcasting is the easier method.

MANURING.

When sowing, a mixed manure of superphosphate and sulphate of ammonia is desirable. The sulphate of ammonia is included, as the young plants will not have sufficient bacteria on their roots to absorb enough nitrogen from the air. A mixture recommended is not less than 224 lbs. superphosphate and 56 lbs. sulphate of ammonia per acre.

As the yields of lucerne when properly established are huge, it is necessary that continuous manuring be resorted to. Not less than 1½ cwt. of superphosphate should be applied twice in each year—first in early autumn and the second in early spring. The reason for this manuring is that each cutting of lucerne may be considered as a separate crop, and when five or six cuttings are made in one year, the necessity for manuring heavier than for the ordinary cereal or pea crop is obvious.

It is particularly beneficial—where the soil selected is suspected to sourness—to apply a dressing of slaked lime at the rate of approximately one ton per acre (half ton quicklime). Where freight charges are high it is preferable to purchase this as quicklime, allowing the lime to air slake before applying. Where liming is to be carried out, it is necessary to arrange the work so that this may be done at least a month before the seed and fertiliser are applied.

AFTER CULTIVATION.

Following on the germination of the lucerne, the farmer's heart is often saddened by a dense growth of weeds, and as the young lucerne plants are not strong enough to withstand cultivation, he is often at a loss to know what to do. The remedy is easy, it being only necessary to keep the whole growth low by mowing or grazing. Where the mower is available it should be used when the plants are just about six inches high. As this cut is not worth gathering, it is left as a mulch over the surface. Often, however, it is decided that the cheapest and easiest method is to graze the field. This for best results should be done as quickly as possible, and with small stock. Where the field is kept low the weeds are losing in vitality during the whole period while the lucerne roots are getting a stronger and firmer hold, giving the plants an added vitality and enabling them to shoot away from the weeds. The grazing or mowing has an added benefit in causing the lucerne crowns to throw out more stems, or, in other words, to stool out.

As soon as the plants are considered strong enough, which may be decided by pulling at the roots, cultivation should be resorted to. The area should be grazed or mown, and the harrows or cultivator then brought in. Where sown in drills the scuffler may, of course, be used without cutting the crop. As a general rule, it should be remembered that the more cultivation given, the better the yields, one effect of stirring the soil being to allow the air in greater quantities into the ground where the nitrogen may be withdrawn by the nodular bacteria. A good routine for working is to decide on two main cultivations in each year—one in early autumn when the first rains are expected, and the other in early spring or when the winter rains are finishing. Topdressing should be applied at these times. After each cutting a good harrowing is particularly beneficial. These cultivations have a twofold benefit—in the cold weather in allowing more free access of air to the nitrifying bacteria, and in the spring and summer in making a mulch, conserving the moisture necessary for the summer growths.

HARVESTING OR TIME FOR CUTTING FOR HAY.

Two main indications are to be looked for when deciding when the lucerne crop is ready to be cut for hay.

(1) When the plants begin to flower.

(2) When the crowns begin to throw out new shoots.

(3) In some cases, in cool weather, loss in feeding value and weight occurs before the plants flower; the indication that this is happening is given by the lower leaves turning colour. Good hay should be green, fresh, free from weeds and rubbish, with a good pleasant aroma, and carrying all the leaves.

If hay-cutting is delayed beyond any of the three stages mentioned above, loss will occur by a loss in digestibility. Leaves will drop off more easily in handling, making for a loss of weight. A further consequence to the delay in cutting is that the succeeding growth will not come away as quickly nor will it yield as well.

The best season for hay-making is during the late spring or summer, as the weather is then suitable for curing. Earlier in the season it will usually be found more profitable to feed green or to graze, as the sappiness of the stalks and the unsettled state of the weather makes the task of hay-making a hazard.

Lucerne "cures" very quickly, so the skill in handling it needs to be higher than that required for ordinary meadow hay. Care should be taken that the drying material is not handled more than strictly necessary during the heat of the day. Raking into windrows and carting to the stack is best done in the morning or late in the afternoon. During the middle of the day the material dries out and becomes extremely brittle, resulting in nearly all the leaf being lost if harshly handled then. In the afternoon when the atmosphere is cooling, moisture is absorbed by the hay, with the result that it can be handled with comparative ease.

It is advisable that the windrows be formed as soon as possible after cutting, allowing the green material time to wilt only. In our climate, as often as not, the hay can be stacked direct from the windrow, but where stacking has to be delayed, it is advisable to form it into large cocks as soon as the plants are dry enough. This may be tested by examining a sample. If, when twisted with the hands, no sap is discernable, it may be concluded that the material is in condition for stacking or placing in large cocks. Care, also, should be exercised that the plants do not get too dry or brittle in the rows.

YIELDS.

Five cuttings in one year is about the minimum that may be expected from this crop. Each cutting should yield at least 1½ tons of hay, so that the minimum quantity of hay that a plot would yield, if not fed green or grazed, would be approximately seven tons per acre. Mr. G. F. Combs, of Jardee, between September, 1928, and April, 1929, obtained seven cuttings from his two acres, and, while feeding it green and as hay to his herd of cows during the whole period, finished up with approximately seven tons stacked in his shed.

LIFE OF A STAND.

The length of time during which this crop will produce these quantities of fodder should make every farmer a lucerne grower. Small plots in the Manjimup-Pemberton area have been in existence from the early days of group settlement, some of the outstanding successes being those of—J. Prosser, 10 acres; D. Hunter, 6 acres; A. V. Kjellgren, 3 acres.

One paddock in the Denmark area has now been down to lucerne for 20 years. Naturally, after a period of years, the stand becomes a little thinner, and it is sometimes then advisable to plough in for a change of crop for a year or two, and then to reseed.

GRAZING.

Where it is intended to graze an area of lucerne great discrimination must be shown, or else considerable damage will be done to the crop. When it is young the roots have not firm enough hold of the ground to withstand the severe tugging and pulling that it would receive from large stock, therefore, while the stand is still young it is advisable to graze only with small stock, and then by putting as many on as possible so as to shorten the time of grazing, and by taking them off

before grazing bare has occurred. Where possible, it is advisable to avoid grazing during the first two years. With sheep it is particularly necessary to exercise care in this respect, as these stock can graze very close to the ground, and as a consequence, if left in the paddock too long, will crop off the crowns of the plants, resulting in the following crops being considerably thinner.

Continuous grazing of lucerne has a particularly bad effect on the crop, and to avoid this, when it is fit for grazing by ordinary stock, it is advisable to put as many on at a time as is possible. This ensures that the whole crop will be eaten off even before the young shoots commence to appear on any portion.

Care should be taken when grazing stock on lucerne that they are not let in when it is wet, either by rain or dew, or when they are very hungry. Hoven is likely to be caused by feeding this succulent feed to hungry stock. The danger is greatly increased when the plants are wet. When cattle are being introduced to this crop after a spell away from it, it is much better that they be well fed first so that they will not be able to consume great quantities, or, if this is not possible, to turn them on for thirty minutes and take them off, letting them on again for a similar period a few hours later. They soon become accustomed to the crop, and will be able to remain in the crop without danger. However, it must be said that grazing, whatever its advantages, materially lessens the life of a stand.

It is difficult to understand why farmers, and particularly dairy farmers, in the South-Western districts do not pay more attention to this crop. As a general statement, it may be said that suitable lucerne soil exists on every location. In the group settlement areas a very large number of farmers have small areas, but have room for increase. In Bridgetown, Balingup, Kirup, Donnybrook, etc., practically none is grown although great benefits would follow its introduction, particularly where the farmer has to milk his cows during the dry months. The provision of green lucerne then will make all the difference in the yield of his stock.

LUPIN INOCULATION.

E. J. Limbourn,
Cereal Breeder, Merredin Experiment Farm.

Two methods of soil inoculation with lupins were successfully tried. In the grass garden, where the seed is planted by hand, soil from the Chapman Farm and in which lupins had previously been grown during the past season was sprinkled in the rows before planting the seed. No nodule formations had appeared on the lupins when planted in the grass garden in previous seasons, but the roots were well encrusted with them after the inoculation. The plants also made better growth and seeded more prolifically, but this may have been due to the seasonal conditions.

For planting by drill the lupin seed was first dipped into a syrup made by melting sugar, and then rolled in the soil obtained from the Chapman Farm. It was found necessary to go through the seed afterwards and break up any lumps formed where two or three seeds had stuck together, but sufficient soil adhered to the seed, and it could be planted with the drill without any trouble. The planting had to be made very thinly, as the amount of seed available was very limited. The inoculation, however, was successful, as was shown by the nodule formations found on the roots. This method will be tried again this coming season in another paddock.

LIVE STOCK AND MEAT.

For the information of readers of this "Journal," the following particulars have been supplied by Messrs. Elder, Smith, and Coy., Ltd., Perth.

COMPARATIVE NUMBERS OF STOCK SOLD AT METROPOLITAN FAT STOCK MARKETS, FOR MONTHS OF DECEMBER, 1930, JANUARY AND FEBRUARY, 1931.

	December.				January.				February.			
	3rd.	10th.	17th.	30th.	7th.	14th.	21st.	28th.	4th.	11th.	18th.	25th.
Sheep	12,398	11,165	17,342	16,113	14,032	13,020	11,105	8,936	9,582	12,509	10,642	9,981
Cattle	715	615	757	726	559	593	558	504	546	507	563	518
Pigs	869	1,202	1,729	615	1,089	1,492	1,315	1,416	1,652	1,569	1,195	1,152

COMPARATIVE VALUES PER POUND.

	December.				January.				February.			
	3rd.	10th.	17th.	30th.	7th.	14th.	21st.	28th.	4th.	11th.	18th.	25th.
	d.	d	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Mutton	3	3½	3½	3½	3	2½	2½	3	3½	3¼	2½	2¾
Beef	4¾	5¼	5¼	5¾	6	6	5¾	5½	5½	6	5¾	6
Pork	6½	6¾	6¾	7¼	7	7	6	6	6	6	6	6
Bacon	5¾	5½	5½	5½	5¼	5¼	5½	5¾	5¾	5½	5½	5½

MARKET REPORT.

Messrs. H. J. Wigmore & Co., Ltd., of Wellington Street, Perth, have supplied us with the following information regarding Chaff offered at auction in the Perth Railway Yards for the period December to February (inclusive). In all cases the price quoted is for f.a.q. to prime Wheaten Chaff, packed in new bags:—

	Quantity.	Maximum per ton. £ s. d.	Minimum per ton. £ s. d.
December, 1930 ..	1,025 tons ..	3 15 0 ..	3 5 0
January, 1931 ..	950 tons ..	3 15 0 ..	3 10 0
February, 1931 ..	845 tons ..	3 15 0 ..	3 10 0

The period under review has been very disappointing from a grower's standpoint, qualities under f.a.q. to prime have been very difficult to quit at low prices. During the months of December, January, and February, there has been very little alteration in the price of f.a.q. to prime Wheaten Chaff. At the time of going to Press the market value for f.a.q. to prime at auction is from £3 12s. 6d. to £3 15s., f.a.q. from £3 5s. to £3 7s. 6d., mediums from £2 12s. 6d. to £2 15s. per ton.

Oaten Chaff.—During the past three months the market has been well supplied, and low prices have been ruling. During December prime green quality was realising from £3 5s. to £3 7s. 6d., f.a.q. from £3 2s. 6d. to £3 5s., mediums from £2 12s. 6d. to £2 15s. per ton. In January good supplies were coming forward to a dull demand, and f.a.q. found buyers at from £2 15s. to £3, mediums from £2 10s. to £2 12s. 6d. per ton. During February several trucks of prime green Oaten realised from £3 2s. 6d. to £3 5s., f.a.q. sold at from £2 15s. to £3, mediums at £2 12s. 6d. per ton.

Oats.—Throughout the period under review there has been little or no alteration in the market value of Oats. The closing quotations are as under:—

December—	
Good heavy feed Guyras, Mulgas and Algerians ..	1/5 to 1/6 per bushel.
Good feed	1/3 to 1/4½ „
Light feed	1/0 to 1/2 „
January—	
Good heavy feed Guyras, Mulgas and Algerians ..	1/5 to 1/7 „
Good feed	1/3 to 1/5 „
Light feed	1/0 to 1/2 „
February—	
Good heavy feed Guyras, Mulgas and Algerians ..	1/5 to 1/6 „
Good feed	1/3 to 1/4 „
Light feed	1/0 to 1/2 „

Wheat.—During December f.a.q. was selling at from 2s. 5d. to 2s. 8d., second grade from 2s. 2d. to 2s. 3d., smutty samples from 1s. 9d. to 2s. per bushel. At the beginning of January heavy supplies were coming forward and the market eased somewhat. F.a.q. was selling at from 2s 2d. to 2s. 3d., second grade from 1s. 10d. to 1s. 11d., smutty and inferior from 1s. 7d. to 1s. 9d. per bushel, but towards the latter end of the month the market firmed to 2s. 6d. per bushel. In February heavy supplies were coming forward to a dull demand, and f.a.q. sold down as low as 2s. 1d. to 2s. 1½d. per bushel. Towards the end of the month very few consignments came forward on account of the low prices ruling, and the market advanced from 2s. 6d. to 2s. 7d., second grade realised from 2s. to 2s. 3d., smutty and inferior from 1s. 9d. to 1s. 10d. per bushel.

METEOROLOGICAL INFORMATION.

STATIONS.	TEMPERATURE.				RAINFALL.		TEMPERATURE.				RAINFALL.		TEMPERATURE.				RAINFALL.	
	Maximum.		Minimum.		For Month.	Average.	Maximum.		Minimum.		For Month.	Average.	Maximum.		Minimum		For Month.	Average.
	Mean.	Highest.	Mean.	Lowest.			Mean.	Highest.	Mean.	Lowest.			Mean.	Highest.	Mean.	Lowest.		
	DECEMBER, 1930.				inches.	inches.	JANUARY, 1931.				inches.	inches.	FEBRUARY, 1931.				inches.	inches.
Chapman State Farm	87·0	105·2	59·7	52·3	0·04	0·22	94·4	106·2	65·3	53·5	0·00	0·27	90·1	107·0	61·2	53·5	0·00	0·48
Geraldton	80·0	107·0	63·1	52·0	0·09	0·16	88·1	106·2	66·3	56·4	0·00	0·22	82·3	104·8	63·2	51·6	0·00	0·30
Walebing	88·1	105·0	57·9	48·2	1·04	0·48	93·4	106·0	62·3	48·6	0·00	0·35	89·4	106·8	59·5	52·3	0·02	0·52
Perth	79·7	101·0	60·5	48·8	0·90	0·58	86·0	104·3	63·1	51·0	0·03	0·34	81·7	102·0	60·1	51·8	0·04	0·43
Kalamunda	80·5	98·3	56·8	48·6	1·68	0·81	87·3	102·2	60·4	42·2	0·00	0·55	82·3	102·0	57·5	49·1	0·03	0·65
Bunbury	75·9	91·5	56·2	44·0	0·35	0·58	81·4	94·0	58·2	44·0	0·00	0·44	76·4	90·0	55·4	46·0	0·12	0·55
Bridgetown	82·7	104·2	49·4	36·0	0·23	0·77	91·4	106·0	50·8	38·0	0·06	0·54	84·3	101·2	47·6	37·0	0·30	0·65
Albany	73·0	97·0	55·5	46·0	2·07	1·16	75·3	102·3	58·7	51·0	0·24	0·84	71·5	91·0	57·7	52·0	0·36	0·94
Merredin State Farm	88·8	102·4	59·1	43·0	0·41	0·54	92·1	104·2	61·9	46·8	0·00	0·52	87·2	99·8	58·8	49·0	0·54	0·56
Northam	88·5	103·8	59·3	46·8	0·37	0·35	93·7	106·0	61·5	48·0	0·00	0·28	88·7	105·4	60·2	53·2	0·56	0·39
York	87·3	105·0	58·2	45·2	0·07	0·41	92·8	105·0	59·4	45·5	0·00	0·31	87·4	104·2	58·7	51·0	0·00	0·45
Narrogin State Farm	84·0	102·7	54·0	44·0	0·12	0·58	89·9	102·7	54·5	39·8	0·00	0·32	82·5	100·8	52·1	40·5	0·03	0·58
Katanning	82·2	103·0	54·4	43·4	1·18	0·62	88·9	101·7	57·1	45·7	0·00	0·37	81·4	100·2	54·5	44·3	0·18	0·57
Cape Leeuwin ...	70·8	85·5	59·5	53·0	1·05	0·86	75·4	99·0	61·2	54·0	0·15	0·66	73·0	93·2	59·8	53·5	0·94	0·85

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